

Author: Pennsylvania Dept. of Fisheries

**Title: Report of the Department of Fisheries of the
Commonwealth of Pennsylvania**

Place of Publication: Harrisburg

Copyright Date: 1904/1905

Master Negative Storage Number: MNS# PSt SNPAG238.5

1904/1905



CHARLES L. MILLER.

REPORT
OF THE
DEPARTMENT OF FISHERIES

OF THE
COMMONWEALTH OF PENNSYLVANIA,

FROM

DECEMBER 1, 1904 TO NOVEMBER 30, 1905.

HARRISBURG, PA.:
HARRISBURG PUBLISHING CO., STATE PRINTER.
1906.



CHARLES L. MILLER.

REPORT
OF THE
DEPARTMENT OF FISHERIES

OF THE
COMMONWEALTH OF PENNSYLVANIA,

FROM
DECEMBER 1, 1904 TO NOVEMBER 30, 1905.

HARRISBURG, PA.:
HARRISBURG PUBLISHING CO., STATE PRINTER.
1906.

DEPARTMENT OF FISHERIES OF THE COMMON-
WEALTH OF PENNSYLVANIA.

COMMISSIONER OF FISHERIES.

WILLIAM E. MEEHAN, Office, Harrisburg.

BOARD OF FISHERY COMMISSIONERS.

W. E. MEEHAN, President.
JOHN HAMBERGER, Erie.
HENRY C. COX, Wellsboro.
ANDREW R. WHITAKER, Phoenixville.
W. A. LEISENRING, Mauch Chunk.

SUPERINTENDENTS OF HATCHERIES.

Corry Hatchery No. 1, William Buller, Corry, Pa.
Erie Hatchery No. 2, Abraham G. Buller, Union City.
Assistant in Charge, Philip Hartman, Erie.
Bellefonte Hatchery No. 3, Howard M. Buller, Bellefonte, R. F. D.
No. 2.
Wayne Hatchery No. 4, Nathan R. Buller, Pleasant Mount.
Torresdale Hatchery No. 5, William H. Safford, Holmesburg, Phila-
delphia.
Temporary Superintendent Union City Auxiliary No. 6, Abraham G.
Buller, Union City.

16629

(1)

1-23-1905

24943



LETTER OF TRANSMITTAL.

Hon. Samuel W. Pennypacker, Governor of Pennsylvania, Harrisburg, Pa.:

Sir: I have the honor to herewith present a report of the work of the Department of Fisheries for the past year, the second report since my incumbency as Commissioner of Fisheries. I felt when making my first report that a satisfactory amount of work had been accomplished; but I determined if possible that the work of 1905 should excel that of 1904. In this endeavor I believe I have succeeded.

Pennsylvania's work in fish culture since the establishment of the Department of Fisheries has attracted the attention of those interested in an increase of fish life in all parts of the country. Commissions of some states have given public recognition in their annual reports of value of what Pennsylvania is doing. Magazines interested in the subject declare that Pennsylvania is a leader in most features of both fish cultural and fish protective work. In at least two instances in the respect of the former it has taken the initiative even over the United States Government. I believe I can say with confidence that more work was done and greater results accomplished by my Department in 1905 than in any single year since Pennsylvania began the task of fish culture and of protecting the fish.

I have been materially assisted in my undertaking by the continued co-operation of each member of the Board of Fisheries Commission. The advice and assistance of the Board has been helpful to a marked degree.

The death of the Hon. Charles L. Miller, of Altoona, on October 2, one of the members, was a source of much sorrow to me and to his surviving colleagues. Mr. Miller had greatly endeared himself to all of us by his manly, upright ways and for the energy with which he performed his duties.

As far as I can ascertain, public sentiment in favor of the Department's work is constantly increasing in strength.

In pursuance of the plan which I adopted last year, I herewith give you for your convenience in my letter of transmittal, a brief outline of the work accomplished.

A marked increase in the number of game fish in all waters of Pennsylvania in which such fish lived.

The rod and line fishing for game fish was the most successful experienced in many years; this was particularly true with respect to brook trout, black bass and wall-eyed pike, commonly called Susquehanna salmon.

An even better season in 1906 is indicated by the presence, for the first time in several years, of the large numbers of young of the species of fish just named.



Pennsylvania's commercial fisheries in Lake Erie rank second among the States which border on this lake. The value of the catch in 1905 was \$201,085.94 for 6,380,757 pounds of fish, a decrease of about \$100,000 and 900,000 pounds of fish. The decrease was caused through a partial enforcement of the new closed season and heavy storms on the lake.

The catch of shad in the Delaware river was at least 929,770 fish with a value of \$424,556. This was a decrease in the catch by nearly 300,000 fish, but this is believed to have been due chiefly to the low temperature of the water.

The German carp industry in Philadelphia amounts to \$123,100 for 2,262,000 pounds of fish, for the whole State the industry amounts to about \$300,000. The capture of 158,729 pounds of eels were reported with a value of \$22,500.

The value of the commercial brook trout industry is reported to have been \$20,461.35.

Shad industry in the Susquehanna river was said unofficially to have been about \$100,000.

The aggregate commercial fish industry excluding the Susquehanna, as reported is \$771,241.94.

Sites for three of the four new hatcheries authorized at the last session of the legislature were located and one put in operation, with more than 2,000,000 eggs being hatched therein on December 1st.

Necessary extensions were made to the Bellefonte and Wayne Hatcheries including about 40 new ponds for breeding fish.

There were hatched and distributed from the five hatcheries in operation during the entire year, 143,550,108 fish of different kinds of which all but about 16,000,000 were what are known as purely food fishes, the 16,000,000 being what are commonly called game fish.

Among the game fishes propagated were 10,200,600 chain pickerel. This is the first time that this species of fish has ever been propagated in any fish cultural establishments in the United States for public distribution.

Among the output were 90,900 frogs. This is the second year for this work by Pennsylvania, and Pennsylvania is the pioneer for this work.

Experiments were begun in the propagation of several minor but useful game and food fishes suitable for the warmer waters of the State, among them being yellow perch, rock bass and cat fish.

The output of brook trout was increased by nearly 2,000,000 fish and the total output of all kinds of fish was nearly double that of the previous year.

A fishway of the Cail pattern was erected in a dam in Pine creek, at Galeton, Potter county, at a cost to the State of only \$1,750.

Progress was made in the beginning of an attempt to suppress the pollution of the water to the extent of killing fish.

The Department by the aid and assistance of a Commission appointed at the last session of the Legislature succeeded in inducing the States of New York and New Jersey to co-operate with Pennsylvania in fish cultural work and for the establishment of uniform laws for the Delaware river and Lake Erie for the protection of fish.

The Department has arranged for harmonious co-operation with

New York, Minnesota and Wisconsin and the United States Government and by the arrangements made Pennsylvania will secure large quantities of eggs of the true muscallonge, Lake Chataqua muscallonge, smelt, California trout, lake trout and other lake fish eggs.

Arrangements were nearly completed at the close of the year for joint work on the part of Pennsylvania, Delaware, New Jersey and the United States for sturgeon work. With New York, New Jersey, Pennsylvania and the United States for shad work on the Delaware river.

Arrangements were made with the United States Government for consignments of silver salmon for introduction into the Delaware for a period of years.

I secured from the United States 70,000 eggs of cut throat trout, hatched and planted them in carefully selected waters to ascertain the propriety of introducing them into the mountain lakes of the State.

California Trout Work was Resumed.

I designed a new type of hatching jar which stood severe tests for efficiency.

I made successful experiments with freezing trout and reviving them to prove that freezing of streams do not necessarily destroy fish.

I drew a rough plan for co-operation with the Commission of New York and the Commission of New Jersey for the establishment of a Tri-State Hatchery on the upper Delaware river in conformity with the resolution adopted by Legislative Commissions appointed by the three States.

I continued with satisfactory results the strengthening of the new State Fisheries Association organized through the efforts of the Department in 1904 to aid in the State's work of fish protection and fish culture.

Acting under section 29 of the act of May 29, 1901, caused the removal, through authorized representatives, of 29,905 German carp from the waters of the State during the year 1905. There were issued to fishermen on Lake Erie 101 licenses, under the act of April 2, 1905, for which they paid \$1,536.

County treasurers issued 208 licenses for the catching of eels by means of fish baskets, for which the Department received \$1,033, five dollars less than the full amount which should have been received. The \$5.00 was traced to another Department to which it had accidentally been paid by the county treasurer.

With the assistance of Professor H. A. Surface, two biological students connected with the State College were assigned to study water life in the different water sheds of the State and the character of the water. Their studies resulted in the discovery of several species of fishes not before known in the waters of the Commonwealth and of much information of great value to the Department.

Fish wardens made 530 arrests of persons charged with illegal fishing. Four hundred and thirty were convicted by justices of the peace, 89 cases were appealed, and five cases were discharged by magistrates.

Amount of money collected for illegal fishing \$8,560, of which the

wardens received one-half and the balance, less 5 per cent. claimed by the county treasurer was paid into the State Treasury.

An important event was the granting of requisition papers by the Governor of New York on your request for men charged with illegal fishing on the Delaware.

Six cases of illegal fish law violators were appealed to the Superior Court, four by the Department and two by the defendants. In two cases the Department gained signal victories and in two there were indecisive judgments rendered. One case was lost by the Department and one case is still pending.

Respectfully,
W. E. MEEHAN,
Commissioner of Fisheries.

SECOND ANNUAL REPORT

OF THE

BOARD OF FISHERY COMMISSION.

To the Hon. Samuel W. Pennypacker, Governor of the Commonwealth of Pennsylvania:

Sir: The Board of the Fishery Commission have the honor to submit this their second annual report.

Since our last report, death has taken one of the members of the Board. On October 22, Charles L. Miller, of Altoona, passed away quietly from heart trouble, after a prolonged illness. Although suffering from this complaint for several years he had been confined to his bed for less than two months. His death although a foregone conclusion was nevertheless sudden. On the date preceding his demise he appeared in a much better condition and indeed was able to direct the transaction of some business, among which was a letter to the Commissioner of Fisheries calling his attention to some fishery matters of importance in Blair county. He passed a comfortable night and on Sunday morning when his physician called he appeared to be in good spirits and in a favorable condition. Within half an hour after the departure of the doctor Mr. Miller was dead; death coming peacefully and quietly as though passing him into sleep. The funeral services of Mr. Miller were held in Philadelphia from the residence of his mother and interment made in Laurel Hill Cemetery.

The Board keenly feels the loss of Mr. Miller. He was invariably genial and bore the knowledge of his fatal complaint with cheerfulness, enthusiastic on the subject of fish culture and the protection and maintenance of the fish of the Commonwealth, he threw himself with enthusiasm into the work and performed his duties as Fish Commissioner to the full.

Mr. Miller was a good citizen and a faithful public official. The Board can pay him no higher tribute.

The second year's work shows clearly that the Department of Fisheries is organized on a strong and good basis. It has become a well constructed machine, working with reasonable smoothness and its work seems to be meeting with general public approval. Indeed

in hatching and planting fish, maintaining and upholding the fish laws the Department appears to be exceedingly strong in all parts of the Commonwealth. With very few exceptions the laws on the statute books relating to fish are approved and regarded as producing the most effective results with the least amount of restriction on fishermen. The one law which has been most widely discussed and over which there seems to be the greatest difference of sentiment is section 17 of the act of June 3, 1878, which forbids fishing on Sunday.

There was a prevailing opinion that the section above named had been repealed by the act of May 29, 1901; but the Superior Court in an opinion handed down last April decided it still to be on the statute books and entirely constitutional. It is difficult for this Board to decide whether public sentiment is more widespread in favor of Sunday fishing or whether it is opposed. It appears to be equally divided. The advocates of Sunday fishing claim that there are thousands upon thousands of respectable law abiding citizens, ardent anglers whose business confine them closely to their tasks or professions for the six secular days of the week, and that Sunday is the only day on which they can pursue their favorite recreation. That fishing on Sunday when properly and discreetly conducted does not interfere in anywise with people who desire to spend the first day of the week in purely religious ways. That a man sitting quietly by the stream side screened by bushes or rocks or who follows the streams in the woods cannot in anywise hurt the sensibilities of the most religiously inclined. There is no noise or open desecration of the Sabbath. They claim that it is less objectionable than bicycling, automobiling, carriage riding or even strolling along the highway or through the fields and woods.

Those who oppose fishing on Sunday for the most part, do so purely on religious grounds, although there is a coterie who declare that it is for the interest of protection of fish that there should be one day in each week in which fishing should be prohibited; that the greatest slaughter of fish occurs on Sunday when most men are at leisure. That while many men would fish quietly and not disturb the religious repose of the day, there are thousands who make fishing simply an excuse for a day's riotous outing.

The only thing of which the Board is really convinced is that an effort to repeal the present law against fishing on Sunday will meet with violent resistance of citizens in all parts of the State and what ever result, there will be wide spread dissatisfaction.

The Department of Fisheries was greatly hampered in its work this year by the enactment of a measure which gave defendants in cases of summary proceedings the right of appeal to answer a charge of misdemeanor before the court of quarter sessions. Fully seventy-five per cent. of all the suits brought by the wardens were promptly appealed under the new act, without regard to whether the defendants were caught in the act of illegal fishing or not. It appeared to the Board of the Fishery Commission that the new act was clearly unconstitutional. Section 14 of article 5 of the Constitution of Pennsylvania declares that in all cases of summary proceedings before a court not of record either party may appeal to some court of record as may be prescribed by law upon allowance of the appellate court or judge thereof upon cause shown. In 1876

an act was passed by the Legislature to carry into effect the provisions of this section of the Constitution. It did so by naming the court of quarter sessions as the proper court. The act of 1905 struck out the provisions permitting either party to appeal and named the defendant only and struck out the provisions which provided "for cause shown." In its place was inserted a provision that the defendant should give bail to appear before the court of quarter sessions to answer a charge of misdemeanor.

Feeling that these changes were clearly unconstitutional and that the efforts of the Department to suppress illegal fishing were being seriously hampered, the Department decided that it was necessary to have the constitutionality of the new act tested and it was put to the expense of employing lawyers in nearly 100 cases to go into court and ask to have the appeals quashed on the ground that the act was unconstitutional. Pending decisions, cases which have been decided by the magistrate courts, and in which fines amounting to very nearly \$4,000 were hung up, indeed most of them are not yet settled. The Lehigh county court was the first to render a decision, and it was emphatically in support of the contention of the Board of the Fishery Commission. In handing down a decision the learned judge of Lehigh county said, "the act is so manifestly unconstitutional as not to admit of argument." The Lebanon county court has also rendered a decision declaring the act unconstitutional. The Board feels confident that there is no other conclusion to be reached and strongly hopes that when it comes to prepare its next report it will be able to declare that this hindrance to its work of fish protection has been entirely removed.

In 1903, it carried one case to the Superior Court on appeal from adverse decisions from the county court, and defended a case against an appeal taken by a defendant who had lost his case in the county court. In the beginning of the present year, the Superior Court handed down decisions sustaining the Department in both cases. During the present year the Board has appealed five cases to the Superior Court in which adverse decisions were rendered by county courts. The particulars will be found in the report of the Commissioner. In four of the five cases the decisions of the county courts appeared to the Board to be very clearly in error and to have been rendered without the importance of having been clearly understood. In the fifth case, the appeal was taken for the purpose of definitely settling a question which is of very great importance both to the Department and the commercial fishermen.

The question was, could the fish dealers in the city of Erie sell wall-eyed pike and blue pike in the State of Pennsylvania from February 15 to June 15, contrary to section 17 of the act of May 29, 1901, relating to fish and fishing in the interior waters, the fish being caught lawfully from the waters of Lake Erie, within the jurisdiction of Pennsylvania, under the act of May 29, 1901, relating to fishing on Lake Erie.

Under the first named act, wall-eyed pike and blue pike were designated as game fish. Under the latter act as food fish; but section 17 of the first named act prohibited the sale of either game or food fish caught in the Commonwealth during the close season. The Department claimed that as that part of Lake Erie covered by the Lake Erie act was within the jurisdiction of Pennsylvania, the

fish could not be sold. The case was tried before a magistrate in Pittsburgh, and the defendants were convicted. The defendants appealed to the county court which reversed the magistrate. The Department took an appeal to the Superior Court and the Superior Court upheld the lower court, giving the dealers the right to sell. This is the only case which the Department has lost, indicating that great care is exercised in preparing and prosecuting cases.

If anything, the public outcry against the pollution of streams during the past year was much greater than the previous year. From data received, the evil of water pollution seems to be on the increase and the demand for legislation to bring about purification, or at least restrict further pollution, is much stronger and more insistent. The outcry against the pollution of streams has taken a much broader ground than the protection of fish, although that remains a prominent issue.

The preservation of public health and animal health are potent reasons given for stopping water pollution in addition to the preservation of the fish. Indeed that phase has put on a more important plane, namely, the preservation of a valuable food commodity.

Of the hundreds of cases of pollution which were reported to the Department, there were only three in which prosecution was justified under section 26 of the act of May 29, 1901. One was a case of a gas company at Honesdale, a second of an artificial smoke establishment on the Swatara, and a third an industrial establishment at Phoenixville. In the first case the parties pleaded guilty, paid their fine and put a stop to the pollution. In the second case the parties were convicted by the magistrate and an appeal was taken to the Lebanon county court and the appeals quashed because the act under which they took the appeal was declared unconstitutional. The case is still unsettled nevertheless, since the allowance of nunc pro tunc was asked for. The third case has not yet been tried.

In two instances owners of industrial establishments on appeal being made to them, either took measures or are taking measures to stop further pollution. One instance was some slag works owned by the Erie Railroad Company at Sharon, Pa., and the other was a paper works at Williamsburg, owned by Mr. Schwabb, of Pittsburgh. Considering the difficulties which confront the Department, these successes, few as they were, are cause for the Board's feeling satisfaction.

Although there are more than 200 special wardens, there were only four cases of irregularities on the part of any of them reported to the Department during the year. One was charged and convicted by the Department of extortion and this is the only instance in which the fisheries were directly concerned. A second warden was convicted of having violated the game laws and was promptly discharged by the Department. A third, who had been highly recommended, was charged by a county detective, who also holds a fish warden's commission, with having practised extortion in relation to game. The case was reported to the Game Commission by the Commissioner of Fisheries and as the matter has gone to court, the Department has taken no action until it is decided whether or not the man is guilty.

The Board takes special pride in the fact that during the year just closed all records in fish cultural work in the State have been

broken save one year in which there was an abnormal number of eggs of one particular species of fish. Not only was there hatched and distributed during 1904 more than double the usual annual number, but on December 1st there were over 12,000,000 more eggs in the various hatcheries than the same time last year. In addition, for the first time in the history of fish culture in Pennsylvania, every hatchery in operation contained eggs and there was one more hatchery in operation than at the same time last year. On December 1st of this year there was a total of 65,223,500 as follows:

Erie, lake herring, 6,880,000; white fish, 41,976,000.
Union City, lake trout, 3,000,000.
Corry, lake trout, 2,000,000; brook trout, 4,500,000.
Bellefonte, brook trout, 3,875,000.
Wayne, brook trout, 3,100,000.
Torresdale, lake herring, 500,000; white fish, 1,280,000.

Had it not been for a great storm which swept over the great lakes the last week in November there is not the slightest doubt that on the 1st of December there would have been in the hatcheries at least 50,000,000 more eggs.

On December 1st, the Department had six hatcheries in operation, an increase of one over last year. In addition it located two hatcheries and there is another yet to be plotted. The hatcheries in operation and located are as follows:

Corry No. 1, 24 acres, established 1872.
Erie No. 2, 80x80 feet, established 1874.
Bellefonte No. 3, 35 acres, established 1903.
Wayne Hatchery No. 4, 29 acres, established 1903.
Torresdale No. 5, 10 acres, established 1903.
Union City Auxiliary No. 6, 30 acres, established 1905.
*Crawford Hatchery No. 7, 25 acres, 1905.
*Spruce Creek Hatchery No. 8, 30 acres, 1905.

The Union City Auxiliary was established under a special act of the Legislature, which appropriated \$15,000 conditional upon citizens of Erie county furnishing at least 15 acres of land. Citizens of Union City, Erie county, instead of 15 acres gave 30 acres. Ground was broken in September and within two months a hatching house 100 feet long and 40 feet wide was erected and ready to receive eggs. This is probably the quickest work on record. In addition a large pond for lake trout was begun, but not completed on account of winter setting in.

The amount of land now devoted to fish cultural work is a little more than 133 acres. When it is considered that the fish cultural work in Pennsylvania was begun in 1870 with one acre, the advance may be considered as gratifying.

On the various hatcheries there are at present eight hatching houses, to-wit: One at Erie, one at Union City, three at Corry, one at Bellefonte, one at Wayne, and one at Torresdale. The first and last are equipped with batteries only. The hatching house at Corry and Bellefonte with troughs only. The hatchery at Wayne con-

*Hatcheries located but not built.

tains both trough and batteries. The total number of batteries are five—two at Erie, two at Torresdale and one at Wayne. The jar capacity of the five batteries is 1,224, and the equipment is as follows: Of the McDonald pattern 760; of the Downing pattern 252; of the Meehan pattern 212. At the Erie batteries there are 508 McDonald and two Meehan jars. At the Torresdale hatchery 252 McDonald, 252 Downing and 10 Meehan. At the Wayne hatchery 200 Meehan. The total number of troughs is 540, 414 inside and 126 outside, also 11 nursery ponds, each with a capacity of four times a single outside trough.

At Union City the inside troughs are: Union City 120; Corry 186; Bellefonte 84; Wayne 24. Outside troughs: Wayne 48; Bellefonte 78. The 11 nursery ponds are at Bellefonte. The 540 inside and outside troughs have a capacity of at least 12,000,000 fry, advanced fry and fingerling No. 1 brook trout. In case of urgency this could probably be increased by at least 3,000,000.

The number of breeding ponds in the hatcheries are as follows: Erie, 3; Union City (incomplete one); Corry, 47; Bellefonte, 42; Wayne, 19; Torresdale, 5; total 117. The purpose for which they are designed are as follows: Erie for perch, bass and frogs, 3; Corry, trout, 43, perch, gold fish, sun fish, etc., 3; frogs, 1. Bellefonte, trout 40, gold fish 1, frogs 1. Wayne, trout 7, bass 2, perch and other species 9, pickerel 1. Torresdale, gold fish 1, white and yellow perch 1, gold fish 1, sun fish 1, unoccupied 1.

Of the eggs in the hatcheries on December 1st all the white fish eggs and some of the lake herring eggs were obtained from Lake Erie within the jurisdiction of Ohio, and some of the lake herring from the neighborhood of the city of Erie in Pennsylvania waters. Of the trout eggs about 4,000,000 were from our own fish at Corry, 900,000 from Bellefonte fish, 300,000 from Wayne fish, 2,100,000 a gift from Penn Forest Brook Trout Company, 1,700,000 a gift from the Weissport Brook Trout Company and 1,000,000 a gift from Colonel Trexler, of Allentown. The Blooming Grove Park Association has always made a gift to the State of its surplus eggs, and on December 1st, the spawn takers began the work of gathering from the fish in the ponds of that organization. There are still some eggs to be taken from the Penn Forest and Weissport hatcheries. The outlook therefore for next spring is at least 1,000,000 more trout than was distributed this year and nearly 3,000,000 more than in 1904. The following are the superintendents of hatcheries and their subordinates:

Corry Hatchery, Superintendent, William Buller; First Assistant, William Haas and Jerry Berkhouse and Charles E. Cowles, short one man.

Erie Hatchery, Superintendent, A. G. Buller; Third Assistant, Philip Hartman and one laborer.

Bellefonte Hatchery, Superintendent, Howard M. Buller; First Assistant, B. O. Webster; Third Assistants, Daniel Houser, Harry Griffith and one laborer.

Wayne Hatchery, Superintendent, Nathan R. Buller; Third Assistants, Fred Demming, Cecil Glanville, one laborer.

Torresdale Hatchery, Superintendent, W. H. Safford, Fourth Assistant, John Sundemeyer; two engineers, one laborer.

Union City, Superintendent, A. G. Buller; First Assistant, E. F. Tinker; Fourth Assistants, Dennis Sargeant, V. B. King.

The output of fish and eggs for the year 1904 was 143,550,108 as follows:

White fish,	34,489,000
Lake herring,	22,840,000
Pike perch,	51,324,000
Blue perch,	9,450,000
Brook trout all sizes,	7,421,835
Rock bass,	9,000
Pickrel all sizes,	10,200,600
Lock Leven trout,	68,000
Trout cut throat,	70,000
Frogs,	90,900
Catfish all sizes,	2,550
Gold fish,	2,470
Black bass all sizes,	7,030
Yellow perch all sizes,	655,150
Sunfish all sizes,	1,475
Lake trout,	977,500
Shad U. S. and Pa. at Torresdale,	3,810,000
Alewife,	2,754
White perch,	2,125,000
Miscellaneous,	2,844
	<hr/>
	143,550,108

During the year there were 195 fish basket licenses granted, 120 less than were issued last year. The cause for the diminishing number is supposed to have been two fold; first almost continuous high water in the Susquehanna river and second to bad advice on the part of some misguided people to the effect that license was not necessary. As will be seen from the number of arrests made, the Department was compelled to prosecute nearly double the number of people for operating fish baskets without a license than the previous year.

It is to be regretted that quite a number of men who did take out licenses this year sought to evade the law and not build their baskets strictly in conformity therewith. This also forced a number of prosecutions. During the year there were 530 arrests made, 430 convictions secured before magistrates and \$11,992.50 in fines imposed. Of the 430 convictions before magistrates, 89 were appealed by the defendants to the county courts. The amount of fines actually collected amounted to \$5,600.00, the wardens receiving one-half and the balance being turned into the State Treasury for the use of the Department. Of the 100 cases discharged, the Department made five appeals to the county courts.

The arrests 58 wardens, regular and specials. J. W. Criswell leading with 82 arrests and 67 convictions. M. F. Albert being second with 61 arrests and 44 convictions. C. H. Nesley with 56 arrests and 49 convictions. Warden C. S. Lowery, although ninth on the list in the number of arrests, leads them all in the amount of fines which he succeeded in having imposed, the sum amounting to \$1,490. He

made 22 arrests and secured 19 convictions. Mr. Criswell is second in the amount of fines imposed the sum being \$1,395. Mr. Nesley is third with \$1,110 to his credit. M. F. Albert fourth with \$1,090, and W. E. Shoemaker fifth with \$1,080; Mr. Shoemaker making 48 arrests and 43 convictions. The following is a tabulated list of the wardens who made arrests with their records:

Wardens.	Arrests.	Convictions.	Fines.
E. W. Campbell,	1	1	\$25 00
J. W. Hague,	23	23	760 00
Albert H. Freed,	11	9	330 00
Jenkin Davis,	16	14	205 00
C. S. Lowery,	22	19	1,490 00
C. P. Coleman,	2	2	50 00
L. S. Houk,	19	19	475 00
George D. Shannon,	25	23	445 00
W. E. Shoemaker,	48	33	1,080 00
C. R. Holland,	26	15	425 00
F. B. Whiteman,	4	4	140 00
J. G. Hill,	1	1	25 00
Will J. Keffer,	19	1	100 00
J. W. Criswell,	82	67	1,395 00
George Spangler, Jr.,	23	23	585 00
D. K. Fisher,	4	1	100 00
C. H. Nesley,	56	49	1,110 00
H. S. Cameron,	1	1	100 00
George F. Shell,	1	1	20 00
Charles D. Chambers,	3	3	75 00
Hiram Brown,	2	1	100 00
H. M. Doud,	1	1	10 00
Geo. E. Hafner,	2	1	10 00
M. F. Albert,	61	44	1,090 00
E. W. Shlery,	3	3	20 00
G. H. Simmons,	1	1	40 00
Fred F. Barrett,	1	1	20 00
E. F. Runhuls,	1	1	25 00
A. B. Winchester,	1	1	10 00
Robert Kibe,	4	1	100 00
R. Schubert,	3	1	25 00
P. H. Kilday,	1	1	85 00
A. G. Farley,	5	5	32 50
Thomas Sells,	3	2	10 00
John E. Foller,	1	1	40 00
Ephraim Behney,	2	2	25 00
Harry M. Jones,	1	1	50 00
Thomas Albring,	2	1	25 00
George L. Horn,	1	1	25 00
Clarence M. Wheeler,	2	1	150 00
Stewart Frey,	1	3	25 00
Harvey Donshimer,	3	2	140 00
Peter Ross,	3	2	125 00
D. A. Pope,	2	2	100 00
L. W. Green,	5	5	65 00
Geo. N. Weaver,	1	1	250 00
Edward Craft,	2	1	25 00
J. L. Hahn,	4	4	100 00
Conrad Benning,	1	1	20 00
Canfield Stone,	1	1	40 00
R. W. Fruit,	1	3	100 00
Jerome Reed,	1	4	100 00
George H. Watson,	3	1	25 00
T. C. Crittenden,	4	4	100 00
George E. Fox,	1	1	100 00
Fred S. Keens,	4	2	50 00
John A. Pennypacker,	2		
J. P. Albert,			
	530	430	\$11,992 50

The above is respectfully submitted.

W. E. MEEHAN.

President.

JOHN HAMBERGER.

HENRY C. COX.

ANDREW R. WHITAKER.

W. A. LEISENRING.

REPORT OF THE COMMISSIONER OF FISHERIES.

In making this my second annual report as Commissioner of Fisheries, I feel I can justly express much gratification at the amount of work which was performed in every department and branch of the Department of Fisheries of the Commonwealth of Pennsylvania. From my personal knowledge of the fish cultural work for many years back and from the reports which have been published in the years before I became associated with the Fish Commissions, I can confidently declare that greater and more effective work was performed and more important results accomplished than in any year since fish culture and fish protection were undertaken by Pennsylvania. The beneficent effects of stocking the waters under the jurisdiction of the Commonwealth with fish incubated at the State hatcheries became, during 1905, very apparent. These were exhibited not merely from the planting of one or two species of fish but from nearly every species which are artificially propagated and planted. It is significant and corroborative of the direct benefits derived from the planting of artificially bred fish, that where there was a distant falling off of the catch of any fish, it was of a species in which artificial propagation has been temporarily suspended for a period of years or where no artificial propagation had been successfully attempted. There are two notable examples of this, the shad and the sturgeon. No shad were hatched and planted by Pennsylvania for five years, beginning with 1900 and there has never been any successful propagation of sturgeon. The returns from dealers show a great falling off of the catch of both these fishes, so great that the wholesale prices realized aggregated very much more money than the much heavier catches in former years. If, as is the case in Lake Erie, with one or two species of propagated fish there was an indicated falling off, a careful study of the tables will show it must have been due to some cause other than the lack of supply. In one or two cases referred to, the falling off was due to violent storms at the season for catching them.

I had been looking for improved fishing in the near future, but I confess and with pleasure that the improvement has come sooner than I anticipated or than I could have reasonably hoped for.

The reports which have been received of the improved condition of trout fishing are astonishing in their extent and explicitness.

From nearly all quarters of the Commonwealth, the reports were uniformly good, indeed it was stated positively, with the exception of a few counties in the extreme western part of the Commonwealth, that there were never before so many trout in the streams. The reports of the wardens and fishermen direct to my office were augmented by the reports of the press generally. With very few exceptions the most conservative declared that their correspondents reported more fish than ever. One, the most enthusiastic, declared as a result of the reports of its correspondents that, "There are more

trout in the Pennsylvania waters this year than in the score preceding. Millions of fry have been furnished by the State hatchery, and under the supervision of the sportsmen of each county, they were distributed in every stream in which it was known that trout would thrive." A number of residents of Wayne county, known widely for their interest in fishing, men who have whipped the streams for from fifty and sixty years, declared to me that the trout fishing in Wayne county is better to-day than it was thirty years ago. Old anglers in Susquehanna county made statements of a similar nature. Fishermen in Centre county said emphatically that the streams there contained more fish than they did twenty years ago. Notable increases were also announced from McKean, Potter, Tioga, Clinton and Clearfield counties.

Even fishermen who declared the fish in a few counties not to have been improved, admitted that the streams were, "full of little fishes." One man living in Lehigh county informed me that his neighbor had importuned him to apply for trout running through his property, but said he, "I would not do it, because last year I planted a couple of cans, and to-day there are as many young fish in the stream as there ought to be, as many in fact as I ever saw in my life."

As an example of good results which have been achieved from stocking, I might quote from a letter written by the secretary of the Bradford Fish and Protective Association, to the Hon. H. C. Cox, one of the members of the Board of Fishery Commission. The secretary says: "The work done by the association the last three years, made the fishing better last year than it has been for a long time." This is only a single sample of the hundreds of letters both from individuals and associations.

A noticeable feature of the reports which came to this office and others which were published in the newspapers, in addition to the reports of the vast number of small fish seen, was an appreciable increase in the average size of trout caught. In former years, it was claimed that with the exception of cases of the larger streams the average size of trout caught was only about 6½ inches. The catch of small fish of 6 inches, and under was the rule rather than the exception, so thousands of anglers claimed. In consequence of this, there came to be a belief in the minds of many that Pennsylvania brook trout did not as a rule grow to a size much beyond 7 inches. The younger members of the great army of fishermen did not know, and the older ones apparently forgot the days when large trout were the rule and small trout the exception. Those who knew the capabilities of Pennsylvania water and who had carefully read the history of the fishing in Pennsylvania, and who knew the deplorable conditions which govern fishing declared that the average small size was due not to any fault of the water in Pennsylvania, or to there being any different varieties or species but to illegal fishing; to an unfortunate clause in the laws which permitted the catch of a 5 inch trout and to lack of intelligent and proper methods of planting fish received by individuals from the State hatcheries.

That the latter were right in their allegations was shown by the general reports of a greatly increase of the average in the size of fish caught. It is safe to say that the average increase was from 6 inch and 6½ inch to 7 inch. Further, from the fact that the catch of 8, 10, 12 and 15 inch fish was said to be very much more frequent.

Newspaper correspondents and reports of the wardens and individuals show further an unusual number of fish of an extraordinary size having been caught. As far as ascertained the heaviest fish taken by rod, hook and line was probably from Gordon Run in Crawford county. It is said to have measured 39 inches in length and to have weighed 5 pounds and 14 ounces. It was probably not a brook trout but a California trout, for it is said to have had the exterior markings of neither a brook nor a brown trout. The fish was caught the latter part of April. On the 28th of the same month there was caught from Pine Creek, Lycoming county, a brook trout which weighed 2 pounds and 9 ounces. Early in June there was caught from the same stream near Blackwells in Tioga county, brown trout which measured 21½ inches in length and had a weight of 4 pounds. The fortunate angler on this occasion only caught two other fish, but these two weighed a little over three pounds, his three fish therefore weighed a little over 7 pounds, and he caught them with a 3 ounce rod and a No. 16 hook.

On the same day a Wellsboro fisherman captured from the same stream near Four Mile Run, a 17¼ inch California trout, weighing nearly 3 pounds, and on the following evening an angler of Leetonia captured a trout of the same species from Slate Run, a tributary of Pine Creek, and which measured 23¼ inches, and having a weight of nearly 4 pounds.

Centre county has long been known for large fish, every year some huge specimen are captured from its waters. On April 28th, a California trout of 23 inches was caught from Spring creek in the heart of the town of Bellefonte, and on July 8th, a Lewistown angler captured a brown trout of 25½ inches from the same stream and within 200 yards of the spot where the California trout was caught, the fish weighed 5½ pounds.

A 20¼ inch brook trout weighing 40 ounces was caught in the Antes creek in Lycoming county, the last week in May and a few days later a Newbury fisherman caught a 24 inch trout, having a weight of 4 pounds and 2 ounces from the Lycoming creek. A Plymouth fisherman caught a 20 inch trout weighing 4 pounds from Bowmans creek the first week in June.

A 2 pound California trout was captured from Wilson's creek, Tioga county on July 2.

During the winter of 1904 and 1905, when, on account of the low temperature, many of the streams were frozen nearly to the bottom, anglers in all parts of the Commonwealth thought the trout streams had been ruined. They saw thousands of trout frozen in the ice, and they felt naturally that these fish must all die. Even I was somewhat affected by numerous reports of this character which came to me, and it led me to order the experiment of freezing fish and thawing them out again to see what proportion would live, if any, the gratifying results of which are given elsewhere. The determination that fish frozen in blocks of ice would not necessarily die gave me renewed confidence as it did also to thousands of anglers in the State when the results of the experiment were published. This confidence was justified later when it was found that the freezing of the streams to the bottom did not destroy the fish.

The marked increase in the number of trout in the mountain streams of Pennsylvania may be attributed to three causes, first the large number of fish which have been planted by the old Fish Commission and the Department of Fisheries.

Second, to the law which declares six inches to be the minimum size of which trout may be caught.

Third, the vigilance of the wardens in arresting and securing the punishment of people who catch undersized fish and in preventing fishing before the opening of the season.

It must not be supposed that in making this statement I wish to infer that all the fish were properly planted, that every fisherman restores to the stream all trout caught under six inches; or the illegal catching of trout in other particulars has ceased, on the contrary I grieve to say that illegal fishing for trout is still widespread, and very many of the fish secured from the State hatchery are improperly planted. But the extent of the illegal fishing is much less than it was prior to the establishment of the fishes and men who fish are rapidly realizing the necessity for observing the laws relating to fish and are exercising greater intelligence in planting the fry in the streams.

In 1902 there were planted in Pennsylvania's waters, three million brook trout, 1903, nearly five million five hundred thousand, and in 1905, the planting reached the enormous number of over seven million four hundred thousand. Plantings such as these must have a beneficial effect on the trout streams of Pennsylvania, despite illegal fishing.

The opening day for trout was exceedingly disagreeable, the weather in the morning was clear but cold and very few trout came to the "fly" the several thousand fish which were caught were mostly taken with worms. For two or three succeeding days snow fell in nearly every quarter where trout congregated and in some instances the cold was so intense that anglers had to stop every few minutes to clear the ice from the guides on their rods so that the line would run through freely. That a large number of trout were caught under such adverse circumstances was in itself strong proof of the large number of fish which exist in our waters. That the trout fishing in Wayne, Susquehanna, Centre and counties of a similar character where the forest areas are relatively small as compared with Pike, Monroe, Clinton and similar counties should be better than for many years ago is a remarkable and gratifying fact, especially when it is considered that to-day there are at least 100 anglers to one, in the period named. It is surely a great triumph for fish cultural and protective fish laws.

One of the most remarkable as well as most gratifying evidences of the increase in trout in our streams comes from Lehigh county. At the close of the season it appears that the fishermen during the open period had had remarkable success. It has been stated emphatically that what are called "fancy catches" were common.

A large number of anglers caught the full limit allowed by law in a single day's fishing and hundreds of people will catch from thirty to forty in a day. Catches of from three to four hundred for the three months were said to be numerous. The favorite streams were the Little Lehigh, Spring creek, Trout creek, Cedar creek, Mud run, Lesely run and Hickory run. That such catches were possible

seem to me remarkable since besides Allentown with its more than thirty-five thousand people has a number of large sized trout, for instance, it is safe to say that there is a population of nearly sixty thousand within twenty miles of the Little Lehigh. There can be no greater evidence as to good results which have followed the stocking of the streams with brook trout from hatcheries and protecting them afterwards from illegal fishermen.

THE BASS SEASON.

If the successful trout season and the greatly increased number of small fish of this species noticed in the streams proved a pleasant surprise to the fishermen, the results of the bass season must have been doubly so. A reference to the reports of the Fish Commission and the Department of Fisheries and to papers read before the State Fisheries Association will show that for the last four or five years there has been an alarming decrease noted in the number of black bass in the waters of Pennsylvania. The decrease was not confined to one locality but seemed to be general throughout the State, with very few exceptions.

Following these reports we find that the decrease was not merely in the catch of legal size fish but what was of far more importance there was noted a marked decrease in the number of smaller fish and of newly hatched fish. By 1904 many streams formerly noted for the abundance of black bass were reported to be almost barren of this great game fish. It was said in 1904 that far more wall-eyed pike commonly called Susquehanna salmon were captured from the Susquehanna river than black bass.

Points like Peach Bottom, Fites Eddy, Bald Friars and Cove, in former years famous as fishing resorts, were declared to be absolute failures. Pine creek, a tributary of the Susquehanna, formerly well-known in the northern part of Pennsylvania as a great bass stream for many miles above its mouth, was said to be almost entirely barren of bass. The Delaware river, its tributaries, the Schuylkill, Brandywine and Darby, all were said to be in the same deplorable condition.

Many reasons were assigned for the rapid disappearance of the black bass. Ice gorges in the Susquehanna and Delaware and some of the tributaries were given by some as a potent cause. It was declared by the adherents of this that the ice not only killed thousands upon thousands of mature bass but tore out the grass beds which afforded shelter for small bass and on which water life necessary for the existence of the little creatures grow and in which minnow life for mature bass could safely be hatched and find shelter for the proper number of minnows.

Another cause assigned was a wide spread disregard for the laws prohibiting spearing and netting. The people who heard of this theory declared that during the spawning season the gigger would pole his boat to a spawning bed and wait for a few minutes until

the frightened fish had returned when it was easily speared, thus destroying thousands of eggs. In this manner they accounted for the almost total absence of newly hatched fish. The decrease in the number of larger fish they attributed to the illegal netter and the men who operated a seine for the capture of carp under section 9 of the act of 1901, which was repealed at the session of the Legislature of 1903.

A third body assigned as a reason for the decrease the need of a liberal infusion of new blood. Black bass were introduced in Pennsylvania waters generally between 1874 and 1880 and it was found out that when animal life and vegetable life are removed from their natural surroundings and transplanted to new environments, there is generally a tendency to eventual barrenness. Insufficient appropriations to the Fish Commission had prevented that body from restocking the streams with small mouth bass for several years and the United States plantings were mostly large mouth bass, which fish was often planted in waters not entirely suitable to them.

While those who advanced the above theories to account for the rapid disappearance of black bass, by far the largest number assigned as a cause, the German carp. Personally, I was inclined to consider that all the theories were actual causes and factors in the trouble and I was inclined to believe that the principal factor was the German carp. During 1905, however, I was confronted with overwhelming evidence that while the German carp might to some extent be a factor in causing a diminishing supply of black bass in some localities it was by no means the principal factor and in some instances had nothing whatever to do with the matter.

There was proof positive for instance that the carp had nothing whatever to do with the decrease of the black bass in Pine creek for the reason that from one end to the other there were no carp to amount to anything. It was also evident in regard to Pine creek that the large fish had not disappeared because of a lack of minnows for the stream was literally alive with small silver chub, with creek minnows and other foods of which the bass are fond. It was also found out by this Department that on the west branch of the Susquehanna above Williamsport, the number of carp was small and the bass fishing poor.

From Williamsport to Sunbury where there are many carp reported, the bass fishing was reported fair in 1904. On the north branch of the Susquehanna above Wilkes-Barre and beyond the culm the bass fishing was very good prior to 1905, and there were many carp. The Perkiomen creek contains large numbers of carp and the bass fishing was fair. On the other hand the Schuylkill river in which carp also abound, the bass fishing was bad. In the Delaware river the conditions were the same as in the Schuylkill, likewise the Susquehanna below Sunbury.

I was thus forced to revise my opinion in regard to the extent of the culpability of the German carp and in looking into the matter more closely became convinced that those who advanced the theory of illegal fishing and of ice devastation were more nearly correct.

Subsequent events have confirmed this view.

Almost as soon as the ice cleared from the streams and lakes, reports began coming to the office of bass seen everywhere. These reports increased in number and positiveness to the opening of the

season. From that time until nearly the end of the year there was a constant flow of letters and newspaper clippings all in the same vein, namely, many fish seen both small and large and fine catches. A correspondent of the Forest and Stream, under date of October 25, said in regard to fishing conditions in the Delaware river during the last ten days of September, "It was no trick for two men in a boat to take 20 to 25 bass weighing 50 to 60 pounds in a few hours, and the fellow who could not get a boat, cast from shore with about equal success. Any kind of bait seemed to be good enough and the fish taken were not small ones either, very few running below a pound and from that to four pounds and over. The river men say they have never known any such fishing since the bass were introduced in the river and they are unable to explain it."

Warden Holland on December 21, reported to this Department as follows:

"More black and yellow bass were caught in the north branch of the Susquehanna river this year than during the last five years."

Mr. W. B. Rhodes, of Danville, Pa., in October wrote as follows:

"I have spent many weeks on the west branch of the Susquehanna river in the vicinity of Montgomery, Lewisburg, Williamsport, etc. I found excellent results in the suppression of outline fishing and gigging in places where formerly the river was infested. There was scarcely to be encountered an illegal fisherman. * * * There is reported more successful fishing at these points for bass and salmon than I have had in some years and this we attribute to the efforts of your wardens to break up the character of the fishing I have written about."

Several wardens who had been assigned to the Schuylkill and Perkiomen streams on various occasions report the bass fishing in these first named stream to be very good and that the stream was "literally alive" with young bass. Officers of the Norristown Fish and Game Protective Association confirmed these reports.

Warden Nesley wrote in his report: "The Perkiomen was never so full of small bass as it is this year. Frequently, while fishermen are dipping with minnow nets for minnows, to use as bait, they catch as many Fingerling bass as they do bait fish. People along the stream attribute this to breaking up of the gigging on the Perkiomen which has saved the mature bass from being killed on the spawning beds. Many catches are being made daily. I saw one man with 31 bass which weighed about 20 pounds and they were caught within 10 hours. The fishermen on this stream average about half a dozen in an afternoon or a morning. Twelve or fifteen a day is the common average."

A study of the newspaper clippings from all over Pennsylvania is interesting from the fact that with very few exceptions they all report the return of the small mouth bass.

The West Chester News on September 22 said:

"Despite the report that bass are scarce in the Brandywine, Coatesville has fishermen who think it a small catch to bring home only from 10 to 20 bass."

The Allentown Call on October 21 says:

"A school of 200 black bass is seen almost daily in the Jordan near Strauss Mill at the northern boundary of the city. * * * The fish have gone into the Jordan from the Lehigh where there is known to be thousands of the gamey fish which have come up into the water since the practice of dumping coal dirt into the river has been stopped."

The Connellsville Courier on October 20, says:

"Another pastime that is engaging the attention of sports these frosty mornings is bass fishing (on the Youghiogheny river). All the fishermen say that these game fish bite in fine style these cool mornings when the water is not too high."

The Oil City Derrick on October 9 announced many large catches of bass and made the following comment:

"Local anglers are commencing to realize that there are better opportunities for catching big fish and more of them in the river (Allegheny) inside or close to the city limits than at other more distant points."

The Reading Eagle on September 21 reported the catch of 77 bass from the Schuylkill river and its tributary, the Tulpehocken, within the previous day or two.

The Scranton Republican on August 11, says:

"Fishing in the river (North branch of the Susquehanna), has been quite good and many fine black bass and wall-eyed pike or Susquehanna salmon have been taken."

The Lock Haven Express under date of August 3, published the following:

"Fish are reported to be plentier in the west branch than for a number of seasons past. This is thought to be due to the fact that the Columbia and Sunbury dams offer no obstruction to their passage up stream and the fishway to the Clark's Ferry dam farther down aids them to make their way up stream."

The Easton Express on August 1 reports:

"Excellent bass fishing in the Delaware."

The Milton Standard on June 2, two weeks before the opening day said:

"Fishermen along the Susquehanna river are authority for the statement that the bass season which will open on June 15 promises to be an unusually good one. For the last two seasons bass fishing on the Susquehanna has been very bad and many fishermen believed it was due to the pollution of the water. This year the shad fishermen below Lancaster report the presence of a large number of bass in every sense which, of course, are returned to the water."

The above quotations it will be noted, cover nearly every section of Pennsylvania. The extreme southwest, the west, the extreme east, the central and northeast and show to what extent the bass have returned and the manner of sport which the fishermen for black bass enjoyed in 1905.

WALL-EYED PIKE OR SUSQUEHANNA SALMON SEASON.

There are men along the Susquehanna Valley and the Juniata Valley who seldom fish for anything save "Susquehanna salmon." These men together with others who are fond of wall-eyed pike fishing have, like those who fish for bass, enjoyed an unusually good season. It was, if anything, better than the bass fishing, the catches were larger both in numbers and size than for many years and there were no parts of the Susquehanna Valley which were exempt. The "salmon" fishing in the north branch, west branch, Lower Susquehanna and the Juniata were equally good and the wall-eyed pike or "Jack salmon" fishing, as the fish is called in the western part of Pennsylvania was just as fine in the Allegheny, Venango and Shenango, relatively as it was in the Susquehanna and its branches. Many fish were also reported from the Delaware above Trenton Falls.

Probably the most interesting event with the wall-eyed pike fishing in Pennsylvania was the visit of a Petersburg gentleman to the office of the Fisheries to inform the Commission that during the late summer and early fall many "salmon" were being caught daily near that place from points where they had never before been seen or known to be. He stated that the fish were nearly all of an even size. From his description they appeared to be two years old and on looking over the records it was shown that two years ago the Department furnished applicants large quantities of wall-eyed pike fry in that locality. People interested in angling in Mercer county declared that planting of wall-eyed pike in streams in that vicinity are showing abundantly.

PICKEREL FISHING IN THE LAKES.

What to many was as satisfactory as the re-appearance of black bass was the good season's fishing for pickerel in a large number of the lakes in northeast Pennsylvania. Some declared that pickerel fishing was nearly as good as it was ten or twelve years ago.

For nearly a decade, people have complained that pickerel fishing in the lakes of Wayne, Susquehanna, Pike and Monroe counties has been decidedly on the wane. In 1901 it was declared before the Sen-

ate Committee on Fish and Game that pickerel in a certain lake in Pike county could not be caught in the summer, that it was only possible to catch them through the ice in the winter. Reliable information was furnished this office to the effect that last summer pickerel fishing was very good in this same lake in which to my personal knowledge the pickerel fishing was very good 20 years ago. Residents of Wayne county have informed me that during the past summer, catches of 15 and 20 pickerel were a common daily occurrence in lakes of that county. Representative Marsteller, of Lehigh county, reported to me that pickerel that had almost disappeared from Twelve Mile Pond in Pike county, last year afforded excellent sport and that more pickerel had been captured from that body of water during 1905 than had been caught together in the previous five years. Nearly everyone unites in declaring that the good pickerel fishing in lakes of the northeast has been due to the rulings of the Attorney General, that only one tip-up might be legally used in fishing for pickerel through the ice. Prior to this ruling and the enforcement thereof by the Department of Fisheries, men were in the habit of using from twenty-five to fifty tip-ups each, a drain on the fish which no small body of water could stand for many years.

OTHER FISHES.

While the fishing for trout, bass, wall-eyed pike and pickerel, admittedly the leading fishes, has been extraordinarily good, the returns from the minor fishes have been equally so with very few exceptions, notably that of the yellow perch and sun fish in regions outside of the mountain lakes. There has been an abundant catfish, striped bass, calico bass, rock bass and sucker fishing. The first and last named have been especially good, Lancaster, York and Adams counties particularly reported an abundance of these species of fish. Many large pike, a fish closely allied to the Chataqua Lake muscallonge were caught during the year in western Pennsylvania lakes, notably Conneauttee and LeBoeuf Lakes, also from streams flowing therefrom.

FISH CULTURAL WORK.

The good fishing I think may fairly be credited chiefly to continued stockings from the State hatcheries and a strict enforcement of the fish laws. In reviewing the fish cultural work of the Department for 1905 it may truly be said that it has not been exceeded or equaled since the establishment of this kind of work by the State. There was one year when the aggregate output exceeded the output

of 1905 by nineteen millions; but a comparison of the tables will show that the enormous output in that year, which was 1897 was due almost exclusively to wall-eyed pike. In 1897 the total output of fish was 165,118,807, of this number 109,455,000 were wall-eyed pike, 43,000,000 white fish, 7,325,000 shad or 159,780,000 leaving 5,338,807 of other kind of fishes, which embraces 2,978,750 trout of different species, 139,107 Atlantic salmon and the remainder of Pacific salmon, black bass, yellow perch, rock bass, spotted catfish, sun fish and muscallonge. A reference to the table which is here appended will show that there is not such wide discrepancies in outputs. It will be noted that in all the leading fishes there is a very greatly increased output except that of wall-eyed pike as compared with the output of 1897. The following is the output of the fish for the year of 1905:

White fish,	34,489,000
Lake Herring,	22,840,000
Pike perch,	51,324,000
Blue pike,	9,450,000
Brook trout all sizes,	7,421,835
Rock bass,	9,000
Pickerel all sizes,	10,200,600
Lock Leven trout,	68,000
Trout cut throat,	70,000
Frogs,	90,900
Catfish all sizes,	2,550
Gold fish,	2,470
Black bass all sizes,	7,030
Yellow perch all sizes,	655,150
Sunfish all sizes,	1,475
Lake trout,	977,500
Shad U. S. and Pa. at Torresdale,	3,810,000
Alewife,	2,754
White perch,	2,125,000
Miscellaneous,	2,844
	<hr/>
	143,550,108

It will be noted by this table that in no instance is there an output reaching 100,000,000. Such figures in the past would merely indicate an exceptional season for taking wild fish. The output of white fish, lake herring and pike perch or wall-eyed pike represent what might be considered simply as a natural increase over a normal output. There was an increase of nearly 2,000,000 brook trout over the previous year, which was an increase of nearly 2,000,000 over the year before. The pickerel is a new venture and all the other fishes noted were either new ventures which will be continued regularly henceforth or which are obviously normal outputs.

THE COMMERCIAL FISHERIES.

In some respects the commercial fisheries were not in as satisfactory a condition as was the angling. This is true both as to Lake Erie Fisheries and the Delaware River Fisheries. There were no reliable data secured concerning the shad fisheries of the Susquehanna; but newspaper reports were to the effect that it was on the whole better than in previous years; but from other imperfect sources the indications are that it was not as good as I should like to have seen it.

Omitting the Susquehanna river and the small commercial fisheries on the Allegheny, the aggregate commercial fish industry in Pennsylvania for the year 1905, was \$771,241.94, divided as follows:

Lake Erie,	\$201,085 94
Delaware shad,	424,556 00
Philadelphia carp market,	123,100 00
Susquehanna eels,	22,500 00
Brook trout,	20,461 35
Total,	<u>\$791,703 29</u>

PHILADELPHIA CARP INDUSTRY.

	Pounds.	Value.
German carp,	2,462,000	\$123,100 00

SHAD INDUSTRY.

Place.	Fish.	Value.
Philadelphia market,	412,500	\$268,375 00
Trenton and New York,	10,000	4,000 00
New York and other points,	507,270	152,181 00
	929,770	\$424,556 00

SUSQUEHANNA EELS.

	Fish.	Value.
Susquehanna eels,	158,720	\$22,500 00

COMMERCIAL BROOK TROUT INDUSTRY.

	Pounds.	Value.
Dead fish,	34,037	\$11,945 85
Live fish,	698,433	7,095 50
Eyed eggs,	1,600,000	820 00
Green eggs given to Department of Fisheries by commercial hatcheries,	5,900,000	\$590 00
		<u>\$20,461 35</u>

The figures given as the commercial fish industry of Erie is probably very close to the actual figures. Those given of the shad fisheries on the Delaware, of the eel industry on the Susquehanna and the Philadelphia carp industry are probably far below the actual figures. Investigators began their work too late in the year to meet all the fishermen engaged in the commercial industry. Moreover, the returns from the license basket men were very meagre, less than half reporting.

In regard to the latter, enough was returned to show that the business on the Susquehanna river was little more than a failure on account of frequent rains during the season when fish baskets could be lawfully used and which caused the devices to be flooded nearly two-thirds of the entire season. The industry reported therefore may be considered as chiefly from tributaries of the Susquehanna and their tributaries.

It may be apropos at this point to draw attention to what seems to me to be some imperfections and injustice in the existing law relating to fish baskets. It is generally admitted that the fish basket, unless properly operated and by an honest fisherman, may be a very destructive device for all kinds of fish. It is therefore entirely proper that if the law governing fish baskets be allowed to stand on the statute books every safe guard against improper use of the basket should be provided.

It is also proper that if a fish basket is to be permitted and if the owner pays his license he should in return be properly protected. Under the present law the entire bottom of a basket must be removed. It seems to me that this provision is an unnecessary mandate of the law. If the law would allow certain sections of the bottom of the basket to be removed I think this non-operation during the closed hours of the day would be just as effective as though the entire bottom of the basket were removed. Under the present law a man builds wing walls and basket, and there is nothing that I know of at present which will prevent some other man the following year, if he be quick enough, from taking out a license for the same spot and so gather the fruit of the labor of the man who had the license the previous year. This seems to me to be very unjust. Under the present law there is nothing to prevent a man from securing a license for a location immediately above a man who has previously secured a license and built wing walls and basket, or to prevent him from so building his wing walls as to cut the lower

man entirely out of fishing. In this respect, if in no other, the present law should be altered. On the other hand there is nothing which will prevent half a dozen men from fastening wing walls together and so completely damming the river from one shore to the other. Authority to do this is entirely wrong, and the law ought to be altered to correct this evil.

I have seen places where it is a practical impossibility for fish to pass up or down a stream without first entering and passing through a basket. I believe, also, that if a man pays a license for a basket, any fish stolen therefrom should be made the subject of larceny, and that any man, other than the owner, who operates a basket, which is licensed, during the season, should be severely punished in addition to the fine which is imposed for operating an unlicensed device. Under the existing act a license is a personal privilege, so it is declared by the Attorney General's Department. I think emphatically it is the basket which should be licensed, just as a hotel is licensed, and the man who secures a license held responsible for the acts of those whom he permits to operate the device.

SHAD INDUSTRY.

Much comment has been made in regard to the fall off of the shad fisheries of the Delaware and Susquehanna rivers and many have been the reasons assigned therefor. There has been a steady decline in the Delaware river fisheries for three or four years, and a large number of people ascribe the following as the reasons:

1. The cessation on the part of Pennsylvania since 1897 of hatching shad.
2. To a great increase in the number of nets, particularly gill nets, used.
3. To a pollution of the water by the cities of Philadelphia and Trenton.

I have no doubt in my mind that a failure to continue regularly the hatching of shad has had something to do with a diminished supply. Weight is given to this argument by the fact that by far the greater number of shad which were caught last season were fish which had been in the river in previous years, that is to say, fish which were more than three years old.

The average large size of the shad caught in 1905 from the Delaware river was a subject of universal comment. This would indicate a decrease in the total supply. There is no doubt also that an increased number of gill nets would have a tendency to decrease the catch. There were occasions when the gill nets were so close together in the Delaware river at the upper end of Philadelphia that they interfered with each other. Still, as the total catch was far below those of previous years, an increased number of nets can hardly be said to account for a less catch in the aggregate.

The contention that the pollution of the river from Philadelphia and Trenton and Chester is any factor in decreasing the catch is absurd. There could be no contention more ridiculous. There is not the slightest foundation for any such assertion. It will take a great deal more pollution, as it now exists, from the three cities named or from all the cities and towns to decrease or wipe out the shad industry on the Delaware river. The pollution of the river to the extent to which it is now polluted will not prevent the shad from ascending, though it does at times render the fish which are caught below Philadelphia, unfit to eat, and therefore should be stopped.

Because I am opposed to polluting the streams and because certain pollution destroys fish life, I do not think it right or a benefit to the cause I advocate, namely, pure water, that absurd statements, such as have been made regarding the pollution of the Delaware, should even be silently acquiesced in by me. While there may be less shad in the Delaware and Susquehanna rivers to-day than there were seven or eight years ago, I am firmly convinced that the fish are not as scarce as generally believed. I feel sure it will be found, and before very long, that it was the meteorological conditions which prevailed during the last four or five springs which have chiefly been responsible for the poor catch of shad.

My conviction in this respect is founded, not merely on the enormous supply which I know existed less than ten years ago, but on the fact that the shad fishing last year was wretchedly poor along the Atlantic coast from Maine to Florida. There was not a river on which the shad fisheries formed an important industry from which the catch was normal or anything like it. This is particularly true of the Connecticut, of the Potomac and of the rivers of North and South Carolina. The United States Bureau of Fisheries advise me that relatively more eggs were taken from the Delaware river shad last spring than from any other river on which shad culture was conducted.

It is a well known fact to ichthyologists, fish culturists, and to observing fishermen that shad will not freely enter a river from the sea to perform their annual function of spawning until the temperature of the water is 60 degrees or higher. If the temperature falls very far below 60, few or no shad will enter. They will postpone the spawning rather or perform that function in some unknown place. For the last six or seven years the temperature of the water in the Delaware river during the shad season has been below what it should be in order to allow the shad to enter freely.

As further confirmation of my conviction that it has been low water temperature rather than a natural lack of fish, I may state that both in the early part of 1905 and 1904 when there was a short period of warm weather during which the temperature of the water went up there was quite a good run of shad. Fishermen both years freely predicted a large catch and they were only disappointed when cold weather again set in and carried the temperature of the river water sometimes as low as 44 and 45 degrees Fahrenheit.

There is not the slightest doubt in the world that the shad fisheries of the Delaware have been maintained for the last twenty years almost entirely by the fish cultural work carried on by Pennsylvania and the United States Government. In 1880 the value of the shad fisheries had sunk to \$80,000 on the Delaware river and subsequently

under artificial propagation the value of the industry rose at times to as high as \$600,000 a year. Shad have annually been a drug on the market. While there has been a great annual increase in the demand for shad, and while to meet that demand there has been naturally a considerable increase in the number of nets, it has not been sufficient to account for the rapid decrease in the number of fish caught in the last six or eight years.

HERRING INDUSTRY.

It will be observed that no note is made in the Commercial Fisheries report of the herring industry, neither on the Delaware or Susquehanna rivers. This was due to the fact that the investigators, sent out by the Department, began their work too late. It is an important industry on the Delaware but far more so on the Susquehanna, although there is very little comparatively speaking on the latter stream within the limits of Pennsylvania. The bulk of the business is done in the river from the Maryland line southwardly and in the upper Chesapeake Bay. I never could quite understand why it is that the Susquehanna herring seem to find a more ready market than those caught from the Delaware river. The species are identical, and many dealers, who are without prejudice, and who handle the fish in large quantities, declare the Delaware fish to be just as good. It is declared by some that the Baltimore market is better for the sale of herring than the Philadelphia market, and as Baltimore is more easily reached from the Susquehanna than from the Delaware, the industry in the former stream is naturally larger. One thing is certain, it is not a lack of supply of herring in the Delaware, for that stream is literally alive with that species of fish from the time the water begins to warm in the beginning of April to the end of the season, the latter part of June. It is a fact that the haul seine fishermen frequently allow thousands to escape because they have taken more than they can use. I hope that this will be the last year in which I will be compelled to state that I have no data as to the herring industry.

It will be noticed in the tables of distribution that the Department hatched and planted several millions herring and it may cause some surprise to the readers of this report that under such conditions the fish should be hatched. But the Department feels that the eggs of no fish which comes into its possession should be destroyed, hence the hatch of a few million alewife or herring at the Torresdale Hatchery in the spring of 1905.

CARP INDUSTRY.

There has been such a widespread condemnation of the German carp that thousands upon thousands of our citizens have come to the

belief that the fish is absolutely worthless for food purposes in this country and fit only to be used as a fertilizer on some man's truck farm. It will therefore be astonishing news when they read that the carp industry in Pennsylvania is only next to that of the shad. As will be seen more than 2,462,000 pounds were sold in 1905, in the Philadelphia market alone. And these figures are much less than the business in Pennsylvania in 1904. No species of fish indigenous or introduced, has probably ever been so heartily and generally condemned as the German carp. It is accused, and rightfully so, as being an insatiable spawn eater and therefore destructive to very valuable food and game fishes.

It has been accused, and rightfully so, of destroying water plants which afford hiding places for young game fish and minnows on which valuable game and food fishes live.

It has been accused, and rightfully so, of rooting among the mud and so befouling the water that valuable food and game fishes have been driven therefrom. There are thousands of people who have eaten the German carp and declare it unfit for food; that it is rank, muddy in taste and of very low quality. But there are thousands, as the figures show, who consume the flesh of the German carp and pronounce it good. But far the greater number of those who deal in German carp are Italians and Jews. The latter purchase live carp only, in order that they may be killed according to their religious observances. The Italians buy the fish, skin them, parboil them, extract the bones, mix the flesh with potatoes, turnips, onions, bread and other substances and prepare a dish which in the whole would not cost them probably more than one cent a pound.

It may naturally be supposed that the German carp if it did find a sale in the market, would be rated at a very low price. Such, however, is not the case. There are very few fish sold which bring as high a price as the German carp. The average price for the twelve months in the year, including the warm summer months, for the fish is five cents a pound, and they have been known to sell as high as twenty-two cents a pound or more than what would be asked at the same time of the year for striped bass, black bass, pickarel or yellow perch.

Personally I do not believe that the German carp is a desirable fish for Pennsylvania waters. There are other species which are prolific breeders, which are far more valuable for the market and food purposes. And I think it was a serious mistake when the fish was introduced. It is destructive of better fish and however well it sells in the market, is undoubtedly inferior in food qualities. I am sorry to say I believe that it is not as easy to get rid of the German carp as it would be of almost any other kind of fish now known in Pennsylvania waters. In fact, I am afraid it is here to stay. I do not believe any legislation can rid us of the Asiatic pest, imported into Germany by the Crusaders and afterwards introduced into the United States. The best that we can hope to do, is to catch all that is possible by legitimate means and persuade others to buy and eat them, even though we might not eat them ourselves.

The fact that there is an over abundance of German carp in Pennsylvania waters is evinced by the fact that during 1905 authorized representatives of the Department removed 25,905 German carp from waters in the eastern part of Pennsylvania, and in one haul

of a night in Presque Isle Bay, at Erie, more than a ton of carp were captured.

EEL INDUSTRY.

Until three years ago the eel industry in Pennsylvania was in a peculiar position. It is estimated that fully one-half of all the fish of this species placed on the market were illegally caught and a good portion of the remainder came from other states, notably Maryland. There was nothing to show either of the value of the eel as an industry. It was known that there were enormous numbers both in the Susquehanna and Delaware and their tributaries. The devices which could legally be used for their capture were fyke nets and dip nets for six months in the year, eel pots, and outlines at night. Of the foregoing, one, the dip net, was of very little value. The fishermen on the Susquehanna river for years demanded the right to use fish baskets, or, as they are sometimes called fish pots. Until 1903 they based their demands not upon the value of the eel as a food commodity but wholly on the ground that the fish was destructive to other food and game fishes, and one, which as it was not desirable, should be removed therefrom. As nature had provided a balance in such cases a contention of this character could not be entertained, and as stated before, the fish basket being a very dangerous device the Legislature logically and properly rejected the demand for legalized baskets.

Finally, in 1903, the fishermen presented, as they should have done before, the value of the fish as an industry and suggested that a license be provided and safe-guards against the catch of other fish be enacted. This was agreed to and the basket became a legal device. For the first time then the catch of eels in Pennsylvania became a well defined and legitimate industry. Although the baskets are licensed, it is almost an impossibility to secure reliable data of the catch or its value. The law permitting fish baskets does not make it obligatory for the owners to furnish the Department with the results of their catches, and even if it did this would only be a portion of the catch for there are the thousands of fyke nets and some eel pots which are constantly used and from which no return whatever is received.

The value of the eel industry in Pennsylvania can scarcely even be estimated. A faint idea, however, may be obtained when it is stated that in 1905 the returns made to the Department from the licensed baskets were 158,729 pounds with a value of \$18,687. There were over \$4,000 worth of eels sold in the Philadelphia market, which by the way is one of the poorest markets for that species of fish in Pennsylvania. The eels sold in the Philadelphia market are taken from the Delaware river exclusively, and it is safe to say that two-thirds of those are taken illegally. It is also safe to say that the eels sold in the Philadelphia market do not represent a one-tenth part of the eels caught in the Delaware river. Most of this species of fish caught from that stream are either sold in the small towns

or cities which lie along its banks: Trenton, Burlington, Beverly, Bristol, Easton, Portland, Stroudsburg and Port Jervis. In addition to the fish which are sold, a great quantity of those captured are taken and consumed directly by the families of the men who caught them or sold to individuals by the fishermen without their putting them through the markets.

The 158,729 pounds of eels reported as having been caught by licensed fish baskets do not represent one-half the baskets which were licensed and in operation. Also, as in the case of the Delaware river, there are the catches from the fyke nets and other devices to be considered. The Lancaster, Harrisburg, York, Williamsport, Wilkes-Barre and Scranton markets are very important markets for eels, and while I cannot substantiate it, I believe I am safe in saying that the towns mentioned themselves consumed more than the 158,729 pounds. I am convinced that if there were faithful reports of all the eels caught in 1905, it would be found that the industry in this fish would be worth at least \$100,000.

FISHERIES OF LAKE ERIE.

Although Pennsylvania has only about 45 miles of territory along Lake Erie, its fishery industry is relatively the largest of any State bordering on that lake. According to Bulletin No. 593, issued by the United States Bureau of Fisheries, there were in 1903 caught from Pennsylvania waters in Lake Erie 23,188,556 pounds of fish, having a value of \$780,015. Of this amount 8,367,707 pounds are credited to Pennsylvania together with a value of \$305,244. New York 2,949,305 pounds, value \$128,445; Ohio 10,748,986 pounds, value \$317,027; Michigan 1,122,5558 pounds, value \$129,299.

On the above figures given by the United States, Pennsylvania, notwithstanding its small territory, ranks second in the catch and value, it being exceeded only by Ohio, and the difference between the two was only 2,381,279 pounds and the difference in value \$11,783.

There can be no doubt that these figures are very nearly accurate for the statistics of the fisheries of the Pennsylvania fisheries gathered by the Department's own officer showed that in 1903 a catch of 7,280,500 pounds, with a total value of about \$300,000, and the catch noted by the Department's officer omitted the catch of two small firms whose business was in another State, though the fish were caught in Pennsylvania waters. There are \$2,196,397 invested in the fisheries of Lake Erie of which \$495,957 belongs to Pennsylvania, and in this particular as in the catch, Pennsylvania ranks second, Ohio only leading with an investment of \$1,205,002.

Taking everything into consideration, the catch from Pennsylvania waters in Lake Erie in 1905 of 6,380,757 pounds, with their value of \$201,085.94, although a decrease over 1905 may not be considered

alarming. In fact there is reason to believe that the fall off may be attributed almost wholly to causes over which the fishermen themselves had no control. In the first place there were frequent storms which tore up the nets and prevented fishing, particularly in the early fall. This naturally would tend to reduce the catch of the herring. A comparison of the tables of 1903 and 1905 of the principal fish will exhibit this point more clearly.

Name.	1903.	1905.
Blue pike,	1,964,000 pounds	3,215,863 pounds
Lake herring,	5,033,000 pounds	3,060,250 pounds
White fish,	36,500 pounds	31,969 pounds

The fall off, it will be noted at once, was in the lake herring and white fish, the heaviest run of which is in the Autumn.

Another cause for a slight fall off in the catch in 1905 was due to the operation of a new law enacted in the early part of 1905, which declared a close season for net fishing beginning with November 15. Immediately on the arrival of the close season the boats naturally stopped fishing. Some were sent to other waters and some were tied up. It is true that subsequently about twenty boats were employed by the Department of Fisheries to gather herring eggs and so to some extent the fishing was resumed, but I think it is safe to say that the close season resulted in a decrease catch by about 100,000 pounds. The fish caught by the boats employed by the Department amounted to 648,307 pounds.

The smallness of the white fish catch will probably cause some surprise especially in view of the general knowledge of the large number of eggs of this species of fish which have been hatched year by year by Pennsylvania and planted in its waters of Lake Erie, but the explanation is quite simple, and in fact was given in Bulletin No. 1 issued by the Department of Fisheries in 1904. The explanation given then is as follows:

"The few white fish is accounted for, because only a few boats were fishing for them with their big mesh nets. Tugs don't get up white fish (big mesh) nets any more; and what big mesh nets were allowed the last two years were mostly used up in fishing for large herring, which the fishermen think is more profitable than to go after white fish exclusively. There is strong evidence that the number of white fish is increasing owing to the work of artificial hatching done by Pennsylvania and the United States. The fishermen all agree that in a few years the white fish will be sufficiently plentiful to warrant the use of white fish nets."

There is good reason to believe that white fish of a catchable size could now be caught profitably in Pennsylvania waters and this feeling is the same by many of the fishermen; but they hesitate to resume the industry on account of the great cost of the white fish nets, and it is not merely the first cost which troubles them but another equally important, namely, the risk which they run of losing the nets.

The best white fish runs are in stormy weather and sometime the nets cannot be set sufficiently secure to hold them against some of the terrific blows and huge seas of Lake Erie. The evidence of the presence of large numbers of white fish is, however, growing so strong that it will be surprising if the fishermen do not soon turn their attention again to this valuable fish and give the herring a chance to rest.

At one time the white fish industry was the most important at Erie. It was nearly double that of the blue pike and lake herring combined. The price the fishermen received being nearly double that of herring and blue pike, naturally the fishermen devoted themselves almost exclusively to it with the result that the white fisheries were almost entirely destroyed. Even with the heavy planting which is made annually by Pennsylvania, it will be a number of years before the white fish industry will once more equal that of the blue pike or lake herring.

It has not been in Pennsylvania alone where there has been a fall off in the white fish industry. The same state of affairs exists in all parts of the lake. The total catch of white fish in 1903 from American waters was only 302,805 pounds, with a value of \$22,988.00.

LAKE HERRING.

It may be that the partial abandonment of the white fish industry may be responsible to a slight degree for a fall off of the lake herring industry. It is not to be supposed that if the fishermen devote practically all their attention in the Fall of the year to this fish rather than the white fish that there could be other than a slight annual decrease in the lake herring. Lake herring were so abandoned for many years and little attention was given to their artificial propagation by either the United States or Pennsylvania. It has only been since the fish has become the principal industry that extensive propagation has been engaged in. Although the lake herring industry ranks second in Pennsylvania waters, for the other lakes it ranks first. The catch in 1903 from American waters was 8,788,625 pounds, with a value of \$33,844, of this catch Pennsylvania is to be credited with 5,033,000 pounds.

As a food fish the lake herring is practically as good as the white fish. Hence, while the great decrease of white fish caught was a great misfortune, it entailed no serious inconvenience to the fish eating public, for there are thousands of pounds of large lake herring eaten every year by people who imagine they are eating white fish under which name they were purchased.

It has been known for a long time among spawn takers, when gathering eggs of white fish, that if there were no white fish males handy to fertilize the eggs it could be done with the milt of herring. This has resulted, so it is said, in a variety of herring superior to the ordinary species and nearly equal in size to ordinary white fish of marketable size.

YELLOW PERCH.

There has been a strong advance in the yellow perch industry. This is not due to any apparent increase in the number of fish but to the fact that it is coming to be recognized as a very valuable food fish. While not among the very largest fishes, it is a delicious table fish. The flesh is firm, white and flakey. It can be transported longer distances and will keep longer than many other species. Last year the industry advanced to third place, there having been caught 53,798 pounds. The one drawback to its stability is the unreliability of the perch to remain in any particular spot. It is a school fish and seems to move at random. In one place to-day and another the next. For three years for example the perch around Erie were so scarce that scarcely any eggs could be secured. Early in 1905, they suddenly returned to their old grounds in the neighborhood of the light house. Their absence during the period named was so marked that many fishermen came to the conclusion that in some manner they had been destroyed. Their reappearance is not only a proof of the vagaries of this, but an illustration of the wandering character of the many other species which come and go.

LAKE ERIE CARP.

As an industry in Lake Erie within the jurisdiction of Pennsylvania the carp is of very little account. Only 2,970 pounds were caught and sold in 1895. These figures, however, do not indicate a scarcity of the carp, on the contrary, Presque Isle Bay is overrun with them, and in Lake Erie as a whole the German carp ranks third as a fish industry, the annual catch being between 3,500,000 and 4,500,000 pounds a year, having an aggregate value of more than \$60,000.

If Pennsylvania law allowed the use of nets in Presque Isle Bay, there is no doubt that the carp industry in the city of Erie would take a leap in the next few years from eighth place at least to third place. As an experiment the Department last September on one occasion had a gill net set in Presque Isle Bay and several hundred pounds of carp were caught. It is the intention of the Department to investigate the matter further during the year 1906.

BLUE PIKE AND WALL-EYED PIKE INDUSTRY.

The Blue pike industry in Pennsylvania waters of Lake Erie is the most important, and for the entire lake it is second, being a

little more than one-half the catch of lake herring. It has been contended by some ichthyologists that there is no specific difference between the blue pike and the wall-eyed pike; that the former is merely the young of the latter. In this belief some fish culturists concurred and stated that there was no known instance of the eggs ever having been gathered from the so-called blue pike. It is, I suppose, unnecessary to state that the contention that eggs have never been taken from blue pike has no foundation in fact. The Department of Fisheries has been taking blue pike eggs for several years to the number of many millions annually.

The one significant point which would indicate that those who claim the two fish to be the same is a fact, that notwithstanding the Department has been hatching and planting many millions of wall-eyed pike every year for many years, the recorded catch of this fish amounts to almost nothing in Pennsylvania waters. There is no reason that I can imagine why there should not be large quantities of wall-eyed pike in Lake Erie within the jurisdiction of Pennsylvania, because of all the fishes which are artificially bred, the wall-eyed pike, although planted immediately on the sac being absorbed, is the best able to take care of itself. Moreover, the history of the fish in the interior waters of Pennsylvania, conclusively show that there is a greater percentage of survivors than of any other fish which the State propagates. It is alleged by some that the waters in Pennsylvania territory are not the best adapted for wall-eyed pike; but a reference to the reports of the United States Bureau of Fisheries for 1903 shows that the total catch of wall-eyed pike in Lake Erie for that year was only 908,484 pounds. It is stated as a reason why there is no report of any catch of wall-eyed pike from the fishermen at the city of Erie that the few fish which were caught were put among the blue pike. Personally, I am inclined to believe that the blue pike is at the best only a variety of the wall-eyed pike, and there is a possibility that it may be identical with that fish, only changed in color and body outline by different environments.

It is partly the catch of blue pike in 1905, and the circumstances connected therewith, which lead me to believe that with very few exceptions there is not a very great decrease in the number of fish in Lake Erie. The catch for 1905 was 3,215,863 pounds, while the catch for 1903 was only 1,964,000 pounds, an increase of 1,251,863 pounds, and what is very significant is the fact that this fish has been persistently sought for by fishermen for several years, as persistently in fact as the lake herring.

BROOK TROUT INDUSTRY.

As in the case of other commercial fisheries in Pennsylvania the figures given above are under what they should be. They represent only the output of the largest establishments and one or two other small ones. There are several very small plants in the State which

would add a few thousands to the above total. Of course, reference is here made only to establishments which are conducted according to law and not to the sale of wild brook trout which is in violation of the Act of May 29, 1901.

Owing to the restricted character of Section 19 of the Act of May 29, 1901, the development of the commercial brook trout industry in Pennsylvania is very difficult. I believe such severe restrictions are wrong. I believe encouragement and not discouragement should be given to men who desire to develop what may become, if properly encouraged, a valuable addition to State industries. At the last session of the Legislature a bill approved by the owners of leading commercial plants was introduced and passed the Senate unanimously, and apparently had no opposition in the House, but fell because of final adjournment before it could be reached on third reading. I believe the bill should be re-introduced into the Legislature at its next session.

It is admitted by owners of commercial trout hatcheries that every safe guard should be thrown around the wild brook trout, and that the sale of such fish should be prohibited in the market or to any one, and to do this it was felt that a bill to permit the unrestricted sale of artificially hatched fish should be carefully prepared. The bill, which was introduced in the early part of 1905, appeared to meet the requirements of the conditions. It provided:

1st. That persons desirous of operating commercial hatcheries should apply to the Department of Fisheries for a permit and operate such an establishment, giving at the same time its acreage and scope and plan.

2d. That the Department of Fisheries should then grant the permit and issue a license for which the applicant should pay the sum of \$40 a year.

3d. That the books of the establishment and the plant should be open at all times to the inspection of the Commissioner of Fisheries. The contents of the books, however, and the operation of the plant be kept confidential unless violations of the law were detected therein.

4th. That annually an account of the total business should be turned in to the Department to be used for aggregate statistical purposes.

5th. That the commercial establishments should be posted with signs giving the number of its license and stating that it was a licensed fish hatchery.

6th. That the establishments might on observing all conditions, sell dead trout for food consumption at any time of the year, but that each sale should be accompanied by an invoice on which should be submitted the number of the license and setting forth the number of fish and the number of pounds sold and the statement that such invoice only held the purchaser free from prosecution for a period of six days. In other words that the person purchasing trout on a certain day must consume or dispose of them within six days.

The enactment of a measure like this would prevent the continuance of the operations of any person who might construct a few ponds, purchase a few thousand trout from one of the larger establishments and then sell many thousand trout, the bulk of which would be caught from the streams by nets and other illegal devices.

WORK OF HATCHERIES.

The Department deems itself fortunate in the possession of Superintendents of the hatcheries, who are not only among the most skillful fish culturists in the country, but who also evince both interest and enthusiasm in their work. Every man in charge of a hatchery has cordially co-operated with me in my desire to bring the hatchery under his charge to the very highest state of efficiency. Each has endeavored to do this despite the fact of insufficient help. What is here said of the superintendents applies with equal force to all the assistants. Two of them, namely, William Haas and Jerre Burkhouse, assistants at the Corry Hatchery have exhibited such proficiency in fish culture that I have felt warranted in appointing them to the superintendencies of the two new hatcheries established Mr. Haas becoming superintendent of the Spruce Creek Hatchery in Huntingdon county and Mr. Burkhouse of the Torresdale Hatchery, in Philadelphia, at which Mr. W. H. Safford is at present acting superintendent until the close of the shad season, when he will take charge of the new hatchery at Conneaut, in Crawford county.

CORRY HATCHERY No. 1.

The oldest hatchery in operation is Corry Hatchery, two miles outside of the city of Corry, in Erie county. It was first established in 1875, and with the exception of about a year, it has been under the superintendency of Mr. Wm. Buller. The first purchase was nine acres, and from time to time since then there have been additions until now the property contains about twenty acres. Nothing can better illustrate the growth of fish culture in Pennsylvania than by the statement that the first year's output from Corry Hatchery was 154,000 brook trout.

The output of 1904 of trout and other fishes was 5,214,615, an increase of nearly 5,100,000. Of this number, over 4,000,000 were brook trout. In the thirty years the Corry Hatchery has been transformed into a beautiful park with the exception of that portion last purchased.

The grounds are shaded by evergreen and deciduous trees, and there is besides a tract of heavy woodland from which for the last two or three years the Department has been able to cut nearly enough timber for its use on the property. The work of the hatchery for the year 1905 was very gratifying, the total output of fish from this hatchery for the calendar year was 5,217,020. Of these, 3,295,500 were brook trout fingerlings Number 2; 1,077,500 lake trout fingerlings Number 2; 68,000 Loch Leven fingerlings Number 2; 335 large males brook trout, 13,000 rock bass fingerlings Number 1, 2,150 black bass, and the following miscellaneous fish, including gold fish, sun

fish and yellow perch. The total output exceeds the previous eighteen months by 22,512 fish, and about 1,000,000 in excess of the previous year.

With the exception of a slight loss among advanced fry of lake trout, through necessary over crowding for a short period, there was no loss from disease during the year at the Corry Hatchery; indeed, the fish at this station have also been singularly free from epidemic of this kind.

There are three hatching houses at this station, two 100 feet long each, and one 50 feet, and in them it is possible to hatch and care for over 4,600,000 trout annually. At the close of the calendar year there were more than 6,000,000 eggs of brook and lake trout in the troughs, and at one time, for a little more than two weeks, there were over 11,000,000 eggs of these two species. Three million eggs were subsequently sent to the new Union City Hatchery for incubation.

Although the Corry Hatchery is primarily for the rearing of trout, it has always been considered as an experimental station. It was here, that under the direction of the superintendent and myself, that black bass and rock bass and yellow perch were first successfully reared after many experiments. The water conditions are, however, not favorable for black bass rearing, because as a rule the water is too cold, and besides there is not sufficient area to produce the fish in very large quantities. Black bass rearing has therefore been abandoned at Corry.

It is doubtful whether success can be looked for annually at this station for yellow perch and rock bass for the same reasons, and also because of the difficulty in preventing surface water from flowing into the ponds devoted to these fish whenever heavy rains occur. On account of the storms and cold weather nearly all the yellow perch hatched at this station last year were lost through algae, the terror of the fish culturists, which freely forms in these ponds to the detriment of the fish.

Superintendent William Buller has always been an ardent experimenter of hybridization, and the past years has produced many curious if not practical results. In 1905, however, an experiment in hybridization between brook trout and Loch Leven trout promises to add a valuable fish to certain waters in the State. By using female Loch Leven trout and male brook trout he has produced a hybrid of exceeding beauty both in marking and outline. The sides of a fish are marbled the same as the back of a brook trout, but what the spot colors will be is at the present unknown on account of the fish being fed on liver, but this spring this feature will be determined by placing a few specimens in a spring, allowing them to hunt for their own food. The fish are now a little over one year old and are about seven inches in length with every indication of producing adult fish about the size of the brook trout.

There are many streams in streams which were once good brook trout streams, but no longer maintain that species through the water becoming warmer on account of the brush which lined the streams having been cut away. It is well known that the Loch Leven trout will live in warmer waters than are required by brook trout, but it is too dangerous a fish for general introduction. It is hoped that the hybrid which Mr. Buller has produced will have all the character-

istics of the brook trout so far as game, food and other desirable qualities are considered without the over destructiveness of the Loch Leven, and thorough experiments in this direction will be made, of course before the new fish is hatched for general distribution. In anticipation of its possible usefulness, I have tentatively named it the Buller trout, *Salvenius fontinalis* var. *Bullerii*.

A number of necessary improvements were made at the Corry Hatchery during the year. The most important were to the hatching houses Numbers 1 and 2. Sixty feet of Number 1 was built thirty-one years ago. Continuous dampness gradually rotted the rafters supporting the roof, and last spring a large section of the roof fell in, fortunately without any damage to the fish in the troughs. It became necessary therefore to put a new roof on the building. Hatching house Number 2 was built over a portion of the trout pond and the floor rafters consequently were rotten and a new floor was necessary. In order that there may be no trouble any time hereafter from rotting of the floor joists, I used railroad iron instead of wood.

The dwelling house, which has been occupied for thirty years by the superintendent, is a structure which was purchased with the property in 1875, and it is probably nearly fifty years old. Built of frame, it has rapidly become unsuited as a residence for the superintendent. It became necessary therefore to build another house for his accommodation. In desiring to build this structure, I was also impelled by the fact that there is no house anywhere near the hatcheries which could be occupied by the first assistant, whose continual presence on the hatchery ground is almost as important as that of the superintendent. With some slight repairs made this coming year the old house vacated by the superintendent can be made available for some time to come for the first assistant. All the buildings on the ground were greatly in need of paint, and during the summer months the employees gave all their spare time to the work of putting on three good coats of white and moss green. These colors, by the way, I have adopted for all the hatcheries as being the neatest and best.

In order that the output of the Corry Hatchery may be increased, I had seven new ponds constructed for trout, which will give room for nearly 20,000 more brood fish. I also held back for breeding purposes at this hatchery, 100,000 fingerling brook trout, and 75,000 lake trout fingerlings for Corry, Union City and Spruce Creek Hatcheries. The purpose in saving such a large number of lake trout is in order that in four years from now the Department may be independent of the wild fish in Lake Erie. Twenty thousand California trout fingerlings hatched from eggs received from the United States were also held for breeding purposes, it being deemed advisable to begin again the work of hatching California trout. The fish is an excellent one and while it is doubtful if it reproduces freely in the streams, the spawning period is at a season of the year when the troughs in the hatching houses are empty, hence, their propagation entails only the cost of feeding the advanced fry and distributing them. Arrangements were also made during the year for raising gold fish at this station on a large scale for distribution among the public schools of the State. The Department believes that this work is very important inasmuch as it is educational. As the principal work at Corry is the rearing of the trout it naturally

follows that the aggregate output of fish is not as great as in the hatcheries where certain other varieties which yield vast quantities of eggs are hatched. Its rank in output last year was Number 4.

ERIE HATCHERY No. 2.

In point of output the Erie hatchery ranks first among the fish hatching stations of the State, it having turned out in 1905, 118,594,874 fish. It has been the most important station in this respect ever since its building in 1885. It is on a piece of ground 82½ feet square at the corner of Second and Sassafras streets, in Erie city, and the first season's output was 14,625,000 white fish. The average annual work done at the Erie hatchery until three years ago was about 60,000,000, all lake fish. One year there was turned out from that hatchery 164,000,000 but such an output was abnormal and due entirely to the fact that there was no storms on the lake during the fall or spring. The output of 1905 may be considered as nearly a normal output with the present methods and the energy of the superintendent and the employes.

The station is nearly self supporting through the moneys realized from Lake Erie from license fees from commercial fishermen. The white fish eggs and wall-eyed pike eggs are gathered from that part of Lake Erie which is under the jurisdiction of Ohio. The herring eggs and blue pike eggs are gathered from waters under the jurisdiction of Pennsylvania.

Like the Corry hatchery, the Erie station is liberally used as an experimental station. It was here in 1904, the first large number of frogs were successfully raised by the superintendent, A. G. Buller. There was a partial failure last year in the frog output, on account of the ponds in which the tad-poles were kept becoming overcrowded. The overcrowd being the result of inexperience in handling this important addition to the Department's work. Out of 120,000 tad-poles they managed to save 30,000. This is the only mishap which occurred at the Erie hatchery during 1905. A full complement of jars was set in the two batteries and a thorough and successful test was made of the new Meehan jar.

Several changes were made in the building which increased its interior space and afforded so much needed additional light. New fry tanks replaced some old and rotten ones and all the wood work, exterior and interior painted.

The Department met with gratifying success in the take of white fish and lake herring last autumn. On the first of December the batteries for the first time in many years were filled with the eggs of these fishes, and a large surplus had to be sent to the Torresdale hatchery. The output in the spring from eggs gathered in the autumn of 1904 was equally gratifying. Of white fish 34,489,000 were planted and of lake herring, 22,840,000. Of the two species of fish the total planting during the year was 57,329,000, last year

44,600,000, the combined planting in 1905 of white fish and lake herring was 12,729,000 more than the combined planting of 1904.

As, under present conditions the white fish and lake herring have to be planted as soon as they have lost their sacs, it frequently happens in the early part of the season, that holes must be cut in the ice and a little later the planting is rendered expensive on account of its being necessary to hire tugs to carry the fish to the planting grounds. These two circumstances emphasized the desirability happily a fact accomplished of having an auxiliary hatchery within a reasonable distance of the present hatchery in order that the white fish and lake herring may be impounded until the fall of the year and also that the Department should own a tug. A boat would be useful also for gathering eggs and for patrolling purposes. A tug large enough for this work and for work in any part of Lake Erie would only cost about \$1,500.

BELLEFONTE HATCHERY.

Station No. 3.

It is not an evidence of an unsuitable site that Bellefonte hatchery No. 3 is at the bottom of the list in the matter of an output of fish. On the contrary the Department has no location which more nearly fulfills all the requirements of its work than this. It is admirably situated with excellent soil for pond building and an abundance of water for its temperature and quantity and conveniently located for the transportation of fish.

The hatchery was designed primarily for the propagation of brook trout and to the present time no other kind of work has been undertaken. The Bellefonte hatchery took the place of what was known as the Allentown hatchery, an establishment located for many years on a rented property in Lehigh county, near Allentown. The fish which were in the Allentown station were not in a desirable state, they had been inbred for many years and had become consequently low in vitality and other good qualities. As a consequence only the younger of the fish in the Allentown ponds, and there were very few of them, were transferred to the ponds of the Bellefonte hatchery, hence, the stock at that station has had to be built up from fry obtained from other sources. This would of necessity make the output almost nothing, unless eggs could be obtained elsewhere.

It happens that eggs were obtained elsewhere, and under these circumstances I must confess that while the Bellefonte hatchery could be in no other position than at the bottom of the lists in outputs the number of trout hatched and sent out was not altogether what it should have been. In other words, conditions in the hatchery during 1905, were not altogether satisfactory to me. For this state of affairs the superintendent can scarcely be blamed. About

the time the incubating eggs were in a critical condition he was seized with a severe illness which illness incapacitated him for the greater portion of the winter months. The scarcity of fish culturists made it impossible to put any one in charge pending the superintendent's recovery until after the spring distribution of fish. The loss of eggs and fry was therefore very heavy, it being nearly 50 per cent. Under normal conditions with the eggs which were in the hatchery we have produced about 3,000,000 fingerlings. Indeed the output was only 1,704,000.

It was not until June first that I was able to secure a capable fish culturist and even then was forced to go beyond the limits of Pennsylvania to secure him, there being none in Pennsylvania out of a position. On July first, I placed him in charge of the Bellefonte hatchery in which position he remained until the latter part of September, when Mr. Howard Buller was sufficiently recovered to fully resume his duties.

The Bellefonte hatchery was located in August, 1903, and in October of the same year a hatching house had been built, some ponds constructed and hatching work begun. The output of 1904 was therefore the first from this hatchery. This would also be a reason for the Station being at the foot of the list in the matter of output since all the energies of the Department were devoted to putting the station into shape for trout, that being the purpose for which it was primarily designed.

Apart from the output an extraordinary amount of work was accomplished at the Bellefonte hatchery. In fact at no other hatchery was the work so extensive or in which as good a showing was made. All the buildings were painted white and green. A meat house, with water-wheel and dam to work it was constructed. Sixty-eight outside nursery troughs were built on the east side of the hatching house. A dam was built across Logan branch on the upper part of the property to force the stream through a raceway to the hatchery grounds, thus giving the property if necessary, almost the entire flow of the creek, several thousands gallons of water a minute. Thirteen concrete ponds, each 30 by 15 feet and supplied with water by a 20 inch pipe. Two ponds 70 feet by 20 each and 40 by 30, one 25 by 20 and five others about the same size or 21 new ponds, making in all about 37 ponds not including the 11 concrete nursery ponds on the west side of the house. All of the ponds with the exception of two are for trout. One is for gold fish and one is temporarily being used to care for frogs. Owing to the favorable conformation of the ground it is possible at the Bellefonte hatchery to so place the ponds that the water can be used to the best advantage and the ponds themselves grouped together. There is only one drawback, namely, that it is not possible to give them as great a depth as I would like them to have. Two additional troughs were placed in the hatching house giving additional capacity of 80 trout fry. With improvements which were made, there is pond room for fish sufficient to yield in the near future, at least 5,000,000 trout eggs, and the hatching capacity is now over 3,000,000 of fingerlings. During the year 12 and 14 acres of land were added to the hatchery grounds carry the property to within 200 or 300 feet of the Great Blue Spring, from which Logan Branch creek has its source. It also added another large spring to the hatchery and gives the

State ownership of the Logan Branch creek from the upper end of the hatchery ground to opposite the hatching house with the exception of about 150 feet, practically giving the State entire control of the water.

WAYNE HATCHERY No. 4.

Those who have followed the work of the Department must be astonished at the great output of the Wayne Fish Hatchery No. 4. Located early in the autumn of 1903 and ground broken on July 15, 1904, it seems incredible that in the year 1905, the station should rank No. 2 in its output of fish, Erie Hatchery No. 2 being the only one to exceed it. This extraordinary result is due to the enthusiasm untiring energy and skill of the superintendent, Nathan R. Buller, working loyally under my direction. With only a small hatching house 60 feet long by 20 feet wide, containing 26 hatching troughs and with an equal number of out side hatching troughs, he succeeded in propagating and distributing 1,655,000 brook trout, and with temporary ponds and by drawing on the natural lakes, he succeeded in securing enough eggs of different fishes to make an output in 1905 of 12,093,300 fish. Of these 10,200,600 were pickerel, a fish propagated for the first time by any fish culturist in the United States. In consequence miscarriages due to inexperience in the work at other hatcheries, the Wayne hatchery had to carry the bulk of the distribution of frogs, a work which was started there suddenly and unexpectedly. For the same reason it has had to carry the bulk of the distribution of yellow perch, although there was at Wayne as at Erie and Corry a tremendous number in the young of this species of fish, owing to sudden and great fall in the temperature of the water and to the leaking temporary ponds in which the fish were being hatched and which compelled a large flow of water instead of scarcely any.

The topography of the Wayne hatchery is unusually well suited for hatchery purposes from the upper to the lower end. There is a fall of more than 25 feet, hence it is possible to so locate a building that water cannot be flowed into any part thereof without the aid of force pumps or other pumping apparatus. A fine large stream of spring water, the head waters of the Lackawaxen creek flowed through the grounds in such a manner as to enable the property to be flooded at any point desired. There is not a spot where a pond cannot be built without first taking measurements to ascertain if the water can be flowed therein from the creek. There are also numerous springs on the west side having a temperature of about 46 and several good springs of equally low temperature just outside the grounds on the east side. The only drawback to the property is that immediately under the surface the ground is very stoney to build ponds perfectly water tight. Hence, all ponds that are now on the hatchery with the exceptions of a few trout ponds on the west side, and the small mouth bass ponds may be considered unfinished since they have not been made water tight.

The lack of bountiful funds is severely felt at the Wayne hatchery. What work has been accomplished has been almost entirely by the regular force, consisting of the superintendent, two assistants and one laborer, with now and then a few additional laborers for short periods.

The Wayne hatchery was authorized by the Legislature in session in 1903, and while its purpose was not fully set forth, I decided that the chief work to be accomplished there was to be fish other than trout. Black bass, pickerel, yellow perch and some of the minor food and game fishes were to be given the preference with trout as an incident only. This object has been steadily kept in view. Under the circumstances the ponds apart from the few trout pounds are very much larger than those seen in most hatcheries. The small mouth bass pond covers an acre and one-third.

Hence, some of the difficulties which were encountered in the hatchery this year, the great output and the great amount of work accomplished gives added ground for astonishment. The superintendent's dwelling was thoroughly repaired, the hatching house painted white and green, 25 outside additional nursery troughs built, 4 small trout ponds constructed, a fine new spring opened and developed, the pickerel pond doubled in size, a large mouth bass pond built, three pickerel fry ponds, three yellow perch fry ponds constructed, a battery capable of holding 300 jars put up in the hatching house, a dam built across the Lackawaxen at the upper end of the property in order to better control the water supply in the hatchery, a wooden sluiceway, 500 feet long, 24 inches wide, and 12 inches deep was built for the purpose of supplying all the ponds in the hatchery and the battery in the hatching house, a stone wall, 250 feet long, 4 feet high and 2 feet thick was built on the west side of the creek near the hatching house to protect that building and the outside nursery troughs from floods, all this was done in addition to hatching and distributing the more than 12,000,000 fish at Wayne hatchery.

Experimental work of great value was also conducted, including experiments with pickerel, yellow perch, frogs and Atlantic salmon. With such a vast amount of work accomplished it is not surprising that there was some failures and discouragements; but in no case were the failures or discouragements the fault of the superintendent or his men, all of whom did everything possible to achieve success.

Failures or discouragements were due entirely to the weather, unexpected adverse water conditions or other circumstances. This is notably the case with black bass work. About the time that the small mouth bass were about to spawn, the water in the ponds fell to 44, and not having control at the time of the supply, it was impossible to check the inflow and so raise the temperature. Even had this been the case it is doubtful whether there would have been more greater success since at the same time the temperature of the air was abnormally low which would probably have kept the temperature of the pond below 50. It is a well-known fact that bass will not spawn with the temperature of the water below 50. At 45 any bass eggs that may have been deposited will die, hence the temperature being at 44 it is not surprising that the small mouth bass at this station was an utter failure. There was no success in rais-

ing large mouth bass the fish had spawned before they were placed in the pond. There was also an entire failure of yellow perch work.

Under normal conditions from the eggs which were obtained there should have been very nearly 30,000,000 of advanced fry for distribution, but at the spawning time, water and weather conditions suddenly changed and just at the moment the little fish were hatching, hundreds of thousand died as they emerged from the eggs. Not having control of the water supply of the leaking conditions of the ponds thousands of other fry which did not die were drawn through the minute openings and perished, hence instead of 30,000,000 of yellow perch there were only 100,800. Owing to the fact that there had not been time to build the regular trout ponds, the energies of the superintendent being devoted to ponds for other fish where brooding fish and the fingerlings reserved for that purpose were placed temporarily in the perch and fry ponds then unoccupied.

The warm summer weather raised the temperature of the water and about 500 died and about 10,000 yearlings were only saved by transferring them hurriedly and temporarily to the hatching troughs and from thence to the new trout ponds built early in the fall in the woods and which are supplied by water from the springs.

There is not the slightest doubt in the world in my mind that before very long the Wayne hatchery will rank No. 1 instead of No. 2, as it now exceeds the work of the Erie hatchery by many millions.

TORRESDALE HATCHERY No. 5.

I have much reason to be satisfied with the work accomplished at Torresdale Hatchery No. 5, especially under the peculiar conditions which existed. There had been a hatchery at Bristol for the propagation of shad. The building was on a rented property. From the year 1898 it had practically been abandoned by the Fish Commission, no work whatever having been done there. It was established in the first instance, entirely for the hatching of shad, and for a period of years many millions of this fish were annually hatched at Bristol.

The hatchery was not very well located, it being a long distance from the best fishing grounds. The Honorable Henry F. Walton, Speaker of the House of Representatives, who is intensely interested in the work of the Department of Fisheries, suggested that the practically abandoned Bristol hatchery might be utilized to better advantage and be operated throughout the year if it were moved to another location. There being no doubt as to the wisdom of this, Speaker Walton entered into the task of assisting me to find a suitable location with enthusiasm.

After visiting several places we found one on the banks of the Delaware at Torresdale. The property was owned by the city of Philadelphia, the greater portion being occupied by a filter plant. The portion which met with my approval for hatchery purposes was a portion which certainly would not be needed for many years and probably would never be suitable for filtration purposes. Speaker

Walton then negotiated with Philadelphia for the acquisition of this property for hatchery purposes and secured ten acres of the most desirable ground. He did more, he induced the city councils to make an appropriation of \$5,000 for the erection of a dwelling house and other buildings for the accommodation of the superintendents and the needs of the hatchery.

The grounds could not be given or sold by the city under the law, and it was therefore leased at the nominal sum of \$1.00 a year. Owing to the fact that it was impossible to secure a fish culturist for about one year, I was compelled to place in charge an assistant who had no knowledge of fish culture but who was able to oversee the work of laying out the place.

The hatching house at Bristol was moved under contract to the new site, and early in 1905 put in condition for hatching fish. A gold fish pond was built and another constructed for gold fish. An old pond eventually to be used for large mouth bass was cleaned, and sunfish planted temporarily therein. Another old pond was partly cleaned and utilized for yellow perch and white perch. Necessarily the water for the hatching house had to be drawn from the river by pumpage. There was only one pump in the hatching house and this was very old and showed signs of breaking down. The building was therefore slightly changed and an additional pump installed.

The interior of the hatching house was lined to keep out the severe cold of the winter and render a stove unnecessary. A dwelling house and a barn was built with the \$5,000 appropriated by the city of Philadelphia, a naptha launch was purchased for river work, and by the authority of the city of Philadelphia, House of Correction men began the construction of a channel from the river shore to deep water and half finished to enable the launch to be brought close into shore at both high and low tides.

A wall was built from a point east of the hatching house on the banks of the river to the edge of the grounds and also from a point west of the hatching house almost to the dwelling house to prevent high tides from flowing on the property. The buildings were all painted white and green, the grounds on the river front were partially graded to above high water mark, a fry pond built and six outside nursery troughs.

In October, 1905, I was able to transfer from the Bellefonte hatchery a capable fish culturist and install him as superintendent, and the bulk of the work accomplished was after his taking his position. Although only in the employ of the State since last June, Mr. W. H. Safford, the superintendent in question, has showed himself to be an enthusiastic employe of the Pennsylvania Department of Fisheries and a very capable fish culturist. When I say that he is showing the same devotion and enthusiasm to the interests of the Department as the superintendents of the other hatcheries who learned their business in the State hatching establishments, I can give him no higher praise.

Under a joint resolution adopted by the Legislature in the spring of 1905, I was authorized to accept the offer of the United States Bureau of Fisheries to do the shad work of the Delaware river jointly with it. The New Jersey Fish Commission expressed a desire to co-operate. Under the agreement made between us, Penn-

sylvania furnished the hatching building and its equipment and carried the hatched fish as far as Trenton. New Jersey took charge of the fish at Trenton and planted them in the head waters of the Delaware near Calicoon. The United States gathered the eggs and hatched them.

Owing to a very poor run of fish there were only 3,810,000 shad hatched and distributed during the season of 1905 and of these 500,000 about were hatched and distributed by Pennsylvania's assistant in charge after the United States Bureau of Fisheries had withdrawn for the season. Two million one hundred and twenty-five thousand white perch were also hatched by the same assistant and the total output of the hatchery for the year 1905 was 5,943,319 fish, giving the station the fourth place in output. Under the circumstances, this was very creditable and was probably as much as could be done.

One of the important features of the Torresdale hatchery was the propagation of gold fish for distribution in the public schools. Unfortunately, owing to poor facilities, although we had a large number of breeders, the number of fish hatched was not sufficient to supply all the schools in Philadelphia or indeed all the schools who made application. It is hoped, however, that the next year there will be a supply for every school in the State.

UNION CITY AUXILIARY HATCHERY No. 6.

At the last session of the Legislature a bill was introduced and passed and signed authorizing the establishment of a hatchery auxiliary to the Erie hatchery to be built in Erie county. An appropriation of \$15,000 was made conditional upon citizens of Erie county giving at least 15 acres of land to be approved by the Commissioner of Fisheries. After examining a number of sites offered, I selected one at Union City, 26 miles from the city of Erie. The citizens of Union City, instead of 15 acres, gave about 30 acres and the deeds for about 24 are now in the possession of the Department.

The property came into the possession of the Department on September 27. On September 28, ground was broken for a hatching house and a building 100 feet long and 40 feet wide was immediately began. By pushing the work it was completed on the night of November 27, and on the morning of November 28, there were nearly 2,000,000 lake trout eggs in the troughs.

One of the most important innovations of fish cultural work in Pennsylvania is to be found in the interior arrangements of this hatching house. At the Corry hatchery, one house has two sets of troughs with an aisle down the middle of the building. The other two have each one set of troughs with the aisle along one side of the building. The Bellefonte hatchery has two sets same as hatching house No. 1 at Corry, and the hatching house at Wayne has one set of troughs, the same as hatching house 2 and 3 at Corry. But in

the hatching house at Union City there are three tiers of troughs, each tier below the other, with the walk along the side. By this arrangement only one-third the water originally required is needed, for the same water is used three times over.

The hatching house at Union City contains 120 troughs. The same size house at Bellefonte, less eight feet in width, contains only about 80 troughs. By adding eight feet to the width of the house at Union City and by placing the troughs in tiers as described, 120 troughs can be used and with only the same amount of water as would be required to run 40 troughs at the Bellefonte hatchery. As using the water over so many times would be likely to exhaust the oxygen, an aerating apparatus has been placed at the head of each of the last tier of troughs and the water passes through it first. The aerating apparatus consists of two ordinary pudding pans, one a little smaller than the other, the smaller placed about six inches above the larger. The bottoms are drilled with holes similar to those in a colander, hence the water flows into the last trough in a multitude of fine sprays.

A dwelling house and a piece of ground was purchased for the use of the superintendent for a very low sum of money and before winter set in a large pond designed for brood lake trout was more than half finished. There is a stream of water flowing through the property, but I do not believe the Department can always depend on all of it, for the reason that it flows from a spring from which Union City obtains its drinking water. But this fact was taken into consideration when the hatchery was located, and there is undoubtedly ample developed water from hundreds of small springs on the property and in addition it has the right of water from what is known as the Shepherd pond, a small natural lake of spring water less than 200 feet from the hatchery grounds.

FURTHER EXPERIMENTS IN WORK RECENTLY BEGUN.

About five years ago the attention of the Fish Commission was drawn particularly to yellow perch. Some experiments made by the United States Fish Commission showed that the eggs of the fish could be readily hatched; but no practical work had been done either by the United States Fish Commission or by any State with this species of fish. The Fish Commission then decided to do some experimenting on their own account of the hatching of yellow perch on a larger scale. It was found that the eggs and milt could easily be expressed from the fish and also that it was not a difficult matter to hatch the eggs. Little, however, was done beyond experimenting until 1903, after the Department of Fisheries was created. Very close attention was given in that year at both the Erie and Corry hatcheries and about 30,000 fish were propagated and distributed in 1904. The superintendents of the two hatcheries found as a result of their experiments that pond hatching was the most econo-

mical method. This was done by placing brush about the edges of the ponds, or allowing the mature fish in the ponds to place their spawn thereon. The one unsatisfactory feature of this method was that owing to the very small fish when newly hatched, it was impossible to tell the number for distribution until distribution time arrived.

In 1905 more elaborate experiments were conducted at the Wayne hatchery with the result that a method was discovered which overcame this one objectionable feature and by which within ten days the number of fish for distribution could be told as accurately as trout. The hatching itself is done by either of two methods, one by the ordinary hatching jars and the other by means of fine meshed trays. In either case the little fry as soon as hatched are placed in ordinary hatching troughs such as are used in our State hatcheries for the propagation of trout. Here they remain until the sac is absorbed and then with some estimate of the number hatching the little creatures are transferred to fry ponds where they remain until distribution time. If jars are used the eggs should be hung in the jars in order to prevent smothering and only should enough water flow through to produce a slight current. And in no case should spring water be used but creek water of as high a temperature as possible. If the trays are used then the trays should be allowed to float free in the troughs so that a slight motion is constantly given the eggs.

The most importance can be accorded to the propagation of yellow perch. In Lake Erie it is becoming an industry of great value, ranking third in Pennsylvania. A fine table fish it is one easily exterminated, it is exceedingly voracious and travels in schools.

A boy with a hook and line and a box of worms can sit in one spot and catch one yellow perch after another in a school until the last one is in his possession. The catching of one perch does not seem to scare the others and as the line is dropped back the remaining fish rush to seize the hook.

In the mountain lakes of north eastern Pennsylvania, the yellow perch is in vast abundance and the people of that section do not yet realize the importance of the fish. It is, however, realized in other parts of Pennsylvania.

FROG CULTURE.

When in 1904 I announced complete success in the preliminary experiments in frog culture, I was fully aware of the importance of the undertaking, but I was astonished at the swift and wide spread public interest which was aroused. The interest was confined not to Pennsylvania alone, but extended to nearly all parts of the United States. Newspapers, trade papers and magazines commented on our work in this direction at considerable lengths, and

all approvingly. Letters from private citizens were received from nearly every State in the country asking for further information. These were followed by communications from Fish Commissions and fish culturists in the same vein.

The Massachusetts Fish Commission made extended comment on Pennsylvania's work in frog culture in its annual report. Pennsylvania's fish cultural authorities have on several occasions been the pioneer in fish cultural work, but nothing seems to have aroused the same general interest as its efforts to propagate the frog and to discover an economical method of handling them.

In 1904 the Department's superintendents discovered that the hatching of frog eggs was in the A B C of fish cultural work. That the caring for and rearing of tad-poles to the period of their complete change to frogs was not as simple a matter as had been supposed. The mere feeding question was child's play. The tad-poles would eat almost anything given them in the way of flesh. Dead fish they were especially fond of and would devour large quantities of dead fish in an incredible short space of time.

It was also found that there were certain species of fish which they seemed to prefer to others. It was discovered, however, that tad-poles required as close and as constant care and attention as an advanced fry of fish. Overcrowding had to be looked out for carefully. It was also found that large tad-poles would eat smaller tad-poles. It was also found that mature frogs would devour the tad-poles and in large quantities. In one pond 200 mature frogs and four snakes succeeded in devouring nearly 60,000 tad-poles in about four weeks. Birds, especially herons, cranes and crows are particularly fond of tad-poles.

It was also found by the Department that it was possible to rear and care for a large number of young frogs in a limited space by providing attractions for insect life. Two methods of doing this were adopted by superintendents. One to scattering boards around the banks of the pond and even on the water, the boards being plentifully smeared with honey, molasses or other substances which insects are fond of. Another superintendent placed around the banks little mounds of horse manure. A tendency on the part of small frogs to crowd in the corners of the inclosure was also noted, and in order to break these congregations into small groups, pieces of scantling were placed on the banks with right angles with the fence and water to good effect.

While it was not definitely settled, the Department has reason to believe from the experiments of these superintendents that the frogs in Pennsylvania spawn twice. Once early in the spring and once early in the summer. While not definitely settled, it is also believed from investigations made during 1905 that the first spawning of all species of frogs in Pennsylvania are transformed into frogs within three or four months. That the second spawning of all species of frogs remain in the tad-pole stage until the following spring. Further investigation, however, may show this not to be the case and that investigations of some years ago to the tad-pole or the common frog, does not make a complete change until the following spring, may be found to be true. At present, however, all indications point in the other direction.

Experiments were begun also during 1905 to ascertain the length

of time required to bring frogs to maturity. Also to the period when they might be of a marketable size. This will naturally take some time, but as far as we have gone, I am inclined to believe that both the market period and the mature period will be much less than originally supposed.

During December both frogs and tad-poles were excavated from the mud in the frog ponds at Bellefonte and Wayne and both were found to be as plump and in as good condition as when they entered the mud at the beginning of the cold weather. There was not the slightest indication of a falling away in plumpness. In one instance both the tad-poles and frogs were carried into the hatching house and placed in warmish water and in a few minutes they were as lively as in the middle of summer.

The output of frogs from the different hatcheries in 1905 was not as great as anticipated by the Department because of troubles and disasters due to inexperience and experiment. The superintendents were directed not to nurse the tad-poles and young frogs as they would young fish but to take all sorts of chances for experimental reasons. In carrying out these instructions, Mr. A. G. Buller, superintendent of the Erie hatchery, doubled the number of tad-poles in each pond over the number of the previous year. For instance, in 1904 he had 30,000 in one pond. In 1905 he placed a little over 60,000, giving them, of course, extra attention. This doubling was done for the sole purpose of ascertaining, if possible, how many tad-poles could be carried safely in a pond of that size which was by the way 15 feet by 15 feet. Events showed that in both cases the number was too great since they were seized with disease and died off at a marvelously rapid rate and, curiously enough, the epidemic started in both ponds within 24 hours of each other, showing first in the pond containing the greater number.

Within 48 hours the loss in the two ponds was very nearly 100,000. Both ponds were then cleared and about 30,000 which were apparently unaffected were planted in certain water spots on the peninsula and watched and those which were not devoured by enemies in time were transformed into frogs. Hence, although at a cost of 90,000 tad-poles valuable knowledge was obtained. It is learned for instance that in a pond 15 feet by 15 feet, 30,000 tad-poles may be safely reared to frogs, and that that many young frogs may be carried for a short period of time in the same space. That 60,000 tad-poles cannot be carried in that space. I am inclined to believe that any number beyond 30,000 is unsafe.

At the Corry hatchery both mature frogs and tad-poles were carried in the same pond and the results watched. When tad-poles first began to disappear a very close examination was made and four very large water snakes were discovered to have managed to get within the inclosure. These were removed and killed, not merely because it was certain they were eating tad-poles but because they were interfering with the experiment which we were making to ascertain the extent to which frogs were eating tad-poles, if they were doing it at all.

There were 200 mature frogs. After the removal of the snakes the tad-poles continued to disappear, but it was not until just before they had nearly all disappeared that it was discovered beyond doubt that the large frogs were freely devouring them, and this dis-

covery was not made until after a similar discovery was made at the Wayne hatchery. At both Wayne and Corry the frogs were detected in the act of cannibalism.

At the Bellefonte hatchery, while frogs were not so detected, a gradually lessened number of tad-poles indicated that they were being used by the old frogs for food purposes. The experiments in this direction are being conducted during the winter months and in this wise. Tad-poles, young frogs and large frogs are being retained in the same pond, both at Bellefonte and Wayne, and the number of each is approximately known. As soon as it is possible after the spring opens, the young frogs and the young tad-poles will be counted to ascertain the number, if any, which are missing. If none are missing, it will indicate that the large frogs during the hibernating season at least, either do not feed or that the young creatures have been able to keep out of the way.

BLACK BASS CULTURE.

I regret to say that the Department during 1905 made no progress in black bass culture, although it added to its information concerning this valuable fish. Of all the fishes for which there is a great demand the most difficult to propagate is the small mouth black bass. Complete success may be achieved one year and the next year may result under apparently the same conditions in almost, if not quite, complete failure. Small mouth black bass culture is as yet in its infancy and this may be stated with positiveness even though it may be pointed out that one or two men in the United States have been able to successfully hatch a considerable number in succeeding years without any disaster. I have known of success in one instance and a complete failure in another where apparently exactly the same methods were employed.

For general information it may be stated that the eggs of black bass either small mouth or large mouth cannot be taken from the fish in the same manner that eggs may be taken from trout, white fish, shad or wall-eyed pike. The fish must deposit the spawn naturally. Even a fish in the act of spawning be taken from the water, it is as far as known, impossible to relieve the fish of the eggs artificially. It is also known that if the water temperature when spawning period arrives is as low as 50, the bass will not spawn. It is also known that if after eggs have been deposited the water temperature falls to 45 the eggs will die. This last is an unusual condition, generally a low temperature only means a prolonged period of incubation, and in the greater number of instances increased vigor of the fish when hatched. The failure of the Department in 1905 to rear small mouth black bass in its one pond which is at Wayne hatchery was in my estimation due almost entirely to the low temperature of the water. On the 15th of June, the water recorded 44 degrees Fahrenheit.

It is possible that if the Superintendent of the hatchery had been able to control the quantity of water that flowed into the hatchery at this period, the temperature of the water might have been raised 5 or 6 degrees; but unfortunately it was not possible for him to do so, for the reason that the supply of water came through a temporary open ditch instead of a sluiceway or pipe with a controlling valve or lock at the intake end. Hence too large a volume of water flowed through the pond when the period arrived for spawning and as the weather was very cold and the spring late the water temperature were both bad for eggs depositing and incubation.

In addition to the cause which I have given above, the superintendent of the station gives another cause, to-wit: An absence of any aquatic growth in the pool.

There is undoubtedly some reason for his holding such a belief that the pond was entirely barren of water life. It had been built the autumn before and there was naturally therefore no water plants in it and consequently no low form of animal water life. Their future has been corrected by planting a large planting of chara plants, one of the best forms of vegetable life for attracting water animal life, especially for bass.

The superintendent of the Wayne hatchery did not rear any large mouth bass. For this, he was in no wise responsible because he received his stocking fish after the spawning period.

ATLANTIC SALMON.

Several years ago the late Henry C. Ford, the President of the Fish Commission, using me as a helper, undertook to establish Atlantic salmon in the Delaware river. Attempts had been made to do the same a number of years before by the late Thaddeus C. Norris and the late Judge Reeder; but the attempts while not absolute failures yielded such unsatisfactory results, that further attempts were abandoned by the gentlemen named.

Mr. Ford and I, however, felt that the River Delaware ought to make a good salmon stream, both on account of the character of the water conditions of the stream and a belief that its outlet in the ocean was not too far south for success. Indeed, the experiments of Messrs Norris and Reeder demonstrated the latter as a conclusive fact. We felt that the cause of the poor results of the plantings was that the fry handled by Messrs. Norris and Reeder were planted in the stream tributary to the Delaware, near Easton instead of the tributaries near the head waters.

The plantings which were made by us in conformity with this idea, resulted in a success far exceeding our anticipations, although Mr. Ford did not live long enough for him to learn the full extent thereof. The eggs from which we obtained our fish came from Maine, but it soon became evident that a continuous supply for a number of years could not be dependent on, hence further stocking had to be abandoned temporarily.

Last year I took up the question again, this time in consultation with the Commissioners of Fisheries of New York and New Jersey. Both were enthusiastic in support of a plan which I formulated to secure eggs if possible from foreign waters and in large quantities, at least 1,000,000 annually.

It was agreed between us that each State should pay for eggs, and for as many as we could secure, that Pennsylvania should hatch at its Wayne station as many as its building could accommodate and that New York would do likewise in one of its hatcheries, and that the fish from the two stations should be planted in suitable streams in Pennsylvania and New York emptying into the Delaware.

Correspondence ensued between me and Canadian authorities, from which it appeared that our hopes of securing eggs from the waters of the Dominion of Canada could not be realized, for the reason that there was a law which forbade the exporting of Atlantic salmon eggs, hence for the present at least, work in propagating salmon must rest in abeyance.

Experiments, however, made in 1904, in attempting to domesticate Atlantic salmon in ponds, were continued both at the Bellefonte and Wayne stations in 1905. At the first named station there are only a few fish; but these are doing well, being from twelve to fifteen inches long each, and two years old. They feed seemingly as freely as the brook trout but they are wild and keep themselves almost continuously in the most secluded part of the pond in which they are confined.

The great difficulty encountered by the superintendents with the young of the Atlantic salmon was to make them feed freely. Food thrown them in the ordinary way would remain untouched and at Wayne it was only possible to induce fingerlings to eat, was for the superintendents to enter the reservoir above the pond and to slowly feed the ground liver through the supply pipe. In this manner, if the superintendent kept himself out of sight, some of the food would be devoured. This method naturally was slow and unsatisfactory and Mr. Nathan R. Buller, the superintendent, set himself to work to discover something better. Unexpectedly he apparently succeeded. Advanced fry were placed in an outside nursery trough having an automatic feeder attached. At first the little fishes ate very little, then it occurred to Mr. Buller that the salmon being a salt water fish, which comes into fresh water to spawn might possibly feed better if the food were a little salty. At first thought, on the face of it, the idea seemed absurd. It seemed so to Mr. Buller; but he thought to try and did. He mixed a goodly portion of the salt with liver and put it in the automatic feeding jar. To his surprise and satisfaction the young fish devoured the food eagerly. They took it as freely as the brook trout. The little fish grew so rapidly that in May they had to be transferred to ponds. As there were no regular trout ponds ready it was necessary to put them in one of the pools intended for pickerel fry and as a consequence the little fish met the same fate which befell the brood trout in August, namely, death through a sudden rise of the temperature of the water. Temporarily therefore further experiments were halted.

As far as we have gone I feel encouraged. That there are great difficulties in the way of domesticating Atlantic salmon. I fully recognize, but one of the greatest, namely, that of inducing the

youngsters to feed freely appears to have been overcome by putting salt in the food. Experience at Bellefonte indicate that when they have once been induced to take artificial food such as is given in hatcheries there is no further trouble on that score to be apprehended.

Of course other difficulties may present themselves but I believe the superintendents in charge of the Pennsylvania Fish Hatcheries are skillful enough to overcome any which may arise. In view of the desirability of securing large quantities of eggs for the purpose of stocking the Delaware river, I deem it essential that every obstacle shall be overcome and Atlantic salmon be domesticated. This is a matter which I intend to keep steadily in mind and am confident of the ultimate success.

NEW WORK UNDERTAKEN.

In addition to expanding the fish cultural work which has been conducted for years and continuing experimental work begun since the creation of the Department of Fisheries, I started some new work. One was the propagation of chain pickerel and a second to experiment with cut throat trout to ascertain if the fish would be suitable to Pennsylvania waters. In the first there was greater success than was expected. At the most I thought only to be able to rear the first year, a few hundred thousand, indeed there was hatched at the Wayne station over 10,000,000. It may therefore be classed, I think among the future annual certainties.

What will follow the introduction of the cut throat trout of course cannot yet be determined. I feel, however, in view of certain undesirable results which followed the introduction of some other fishes from distant waters that the Department should proceed with caution. The cut throat trout in its natural environments is undoubtedly a fine fish. It is generally conceded, however, that in the streams it is not as good as our eastern brook trout, or char. I therefore am inclined to believe it to be not a desirable fish to plant in the same waters with our brook trout. The fish is said to attain a very large size in mountain lakes, and it is also said to be a fish which, in such waters will rise to an artificial fly. If this be the case then it is likely to be far superior to our lake trout which can only be caught by sportsmen by what is known as bottom fishing. Feeling as I do I judge it best to begin my experiments with cut throat trout by planting them only in lakes. I selected three, one in Wayne, one in Susquehanna and one in Luzerne county. It will be a year or two before the results of the planting are known.

PROPAGATION OF PICKEREL.

Between forty and fifty years ago nearly all the sluggish waters in eastern Pennsylvania teemed with pickerel, especially the streams

near the border line of New Jersey. Three-fourths of the natural mountain lakes also contain large numbers of this fierce but excellent food fish. The pickerel in the streams were soon wiped out so that twenty-five years ago it was rare to find pickerel in any of this type of water, except an occasional "stray." With very few exceptions there has been a rapidly diminishing supply in the mountain lakes.

Destructive methods of fishing undoubtedly has been the one potent cause for this marked reduction, another was that no efforts were made to restock. No fish culturist in the United States had undertaken to hatch pickerel, even the United States had not undertaken the work. Many State Fish Commissioners and many fish culturists said they did not expect to, for while the pickerel is classed as a game fish many anglers looked upon it either as inferior or otherwise not worthy of propagation. As one Commissioner said to me somewhat contemptuously, "No we never have attempted the propagation of pickerel and I do not think we ever will."

Many people interested in fish culture, while bearing in mind the great public demand for brook trout, black bass and certain other high class game and food fishes, over-looked the fact that there are thousands of people who enjoy fishing for pickerel and who esteem the fish very highly as a game fish and as a fish for the table. I have heard large number of people declare that they were as fond of the flesh of pickerel as they were of trout.

In the last five or six years there have been strong appeals first to the Fish Commission and then to the Department of Fisheries for the propagation of pickerel. I felt that the appeals were just. As soon as the Wayne hatchery was established I decided that ponds should be set aside for hatching pickerel and that an effort should be made to propagate on a large scale.

In Wayne county not many miles from Honesdale there is a large artificial pond owned by an organization of gentlemen, known as the Wildwood Club. The pond is literally alive with pickerel and they are carefully preserved. The Wildwood Club taking an interest in the work which I was about to undertake, gave their consent to the catching of as many breeding pickerel as was desired. One hundred and thirty-five were taken out in one day and transferred to the Wayne hatchery. In the spring when spawning time arrived it was found as stated elsewhere in this report that all but nine of the 135 fish were females, hence it became possible to fertilize only about a million eggs.

Mr. Nathan R. Buller, the superintendent, placed the eggs in Downing jars supplied by water drawn from the bass ponds. He found it very easy to take the eggs but they were glutinous and difficult to separate, nevertheless they appeared to be doing very well, when the water supply was suddenly cut off one night through the heedlessness of an employee of a concern who owned a dam some distance from the hatchery, before the water could be turned on again, the eggs all died.

Mr. Buller then gathered 68 quarts of eggs from naturally spawned fish in the water of the Wildwood Club and subsequently about the same quantity from one or two natural ponds in the vicinity of the Wayne hatchery. These eggs, instead of attempting to hatch them in jars, he placed on trout hatching trays having first

discovered a means of thoroughly separating them and cleaning them as effectively of the glutinous substance as is possible with wall-eyed pike eggs. When the eggs were gathered they were in an advanced stage of incubation, hence, nearly all the eggs hatched. The creatures were exceedingly small and nearly translucent. A large number placed in a can of water could scarcely be seen, in fact some applicants on receiving a supply were inclined to doubt that any fish had been sent at all and that they simply received the cans of water. Each can contained from 10,000 to 15,000.

As the securing of such a large quantity of pickerel eggs was unexpected, no preparation had been made for holding the fry and it became necessary to plant them without even waiting for the absorption of the sac. Different people in Wayne, Pike, Monroe, Susquehanna, Lackawanna and Luzerne counties known to be interested in the planting of fish were telegraphed to and all of them came very promptly and gladly took charge of planting the little creatures. Large quantities were also planted by the Department itself in the ponds from which the eggs were originally taken. In all, probably about ten times the number that would have hatched naturally. The total planting was 8,890,500, a gratifying number for a first attempt at hatching.

Judging by the results of the superintendent's work it will not be necessary to hold a large number of mature pickerel in the hatchery as it appears that the chief reliance may be placed on wild eggs gathered from the spawning grounds in the mountain lakes. But in case of failure I think it wise that some breeding fish should always be retained so that an annual supply may be certain. The pickerel work now thus inaugurated auspiciously by the Department will undoubtedly be regarded with great satisfaction throughout the State and may be followed with interest by fish culturists, since as far as known no previous attempts have been made by anyone to hatch the fish. The New York Forestry Fish and Game Commission it is true, have been hatching muscallonge in Chatanqua Lake for many years, using floating boxes; but the cousin of the muscallonge, the pickerel, has apparently been entirely overlooked.

Co-incident with the work of propagating pickerel at Wayne county, Mr. William Buller, Superintendent of the Corry Hatchery, undertook to hatch the eggs of the grass pike. Like Mr. Buller, he found no difficulty whatever in taking the eggs from the fish, like Mr. Buller also he experienced great difficulty in keeping the eggs from sticking, owing to their glutinous. He placed the eggs in jars and succeeded in hatching a large percentage of the eggs, unfortunately the water was so very cold that all the little fish died within twenty-four hours after hatching. The grass pike is a valuable fish, and I believe should be propagated on a large scale, and I am therefore making preparations in that direction for next year. I do not believe it will be feasible to gather any large quantities of wild eggs of the grass pike as is the case with the pickerel, and therefore if they are to be hatched by the million, it will be necessary to retain fish in breeding ponds. Large fish have been sent to the Wayne Hatchery for this purpose.

CALIFORNIA TROUT.

A number of years ago, among the fishes propagated to the number of several hundred thousand a year was the California trout. They were bred both at the Corry and the Allentown hatcheries. Many letters were received, all praising the fish, but declaring that there seemed to be very little result from planting. Investigations made by the Commission apparently sustained the reports. Very few streams could be found, which had been stocked with California trout, in which it appeared that the fish spawned naturally. There were many streams in which the fish were planted where they grew.

At the same time a careful study of the fish in the ponds at the two hatcheries was made by myself, then statistician for the Fish Commission. The findings from my study were very curious. In one of the ponds at Allentown there were about 1500 fine, apparently very healthy, California trout in the prime of breeding age.

Fully 50 per cent. of the females in this pond were barren every year. It did not necessarily follow that the same fish were barren. Second, fully 50 per cent. of the fish, which were not barren, yielded opaque eggs or eggs of no value. Fully 50 per cent of the males were barren, and fully 50 per cent of the remainder yielded "cheesy" milt.

In their natural environments, the California trout spawns late in the spring, but in the Allentown ponds they spawned simultaneously with the brook trout, namely, from October to the latter part of December.

At the Corry hatchery the fish were in apparently the same fine healthy condition. There was a percentage of barren females and a percentage with opaque eggs, but in both cases the percentage was far below that in the Allentown pond. The same may be said of the males. The spawning period at the Corry hatchery was March and April or about the same as in their native waters.

Taking into consideration the extraordinary large number of sterile fish in the Allentown ponds and the percentage at the Corry ponds, there was still further color given to the belief that fish planted in the streams were not to any extent reproducing their kind. It is a well known fact in biology that where animal and vegetable life is taken from its natural surroundings and transplanted to other environments, in many cases there is a more or less rapid tendency to infertility.

There are many notable instances of this in almost every branch of the animal or vegetable kingdom. In the human race for example, it was shown conclusively that when the Mamelukes were taken from the Caucasus to Egypt, even under the most favorable conditions and where there was a marriage with females of their own race, there were very few children, and the children when mated were generally without progeny.

Monkeys brought from their native land to Europe and America notably become barren and almost immediately. Transplanted plants often show a tendency to infertility, hence, the California trout transplanted from the Pacific coast to the Atlantic coast might be expected to have a tendency the same way. After mature

deliberation, I felt that as there was a very great demand for brook trout, and as there was limited pond room in both hatcheries, and as the results in the streams did not come up to expectation and as there was very many infertile fish in the ponds, it would be better to stop propagation of California trout especially as they spawned at the same time at Allentown as the brook trout, and use the ponds for the latter. I so recommended and the Fish Commission endorsed it.

After the creation of the Department of Fisheries, with greatly extended opportunities for wider and more careful observation, I found throughout the State a woeful lack of knowledge of the proper methods of planting trout, and I started a campaign of education with very gratifying results. On learning that there was not a widespread knowledge of planting trout, I recalled the experience with the California trout, and I came to the conclusion that possibly this might be a cause for non-success rather than that of changed environment and consequently possible infertility.

Weight was given to this by further knowledge that while the Commission was planting from two and a half to three million brook trout a year, the plantings of California trout really never went over three hundred or four hundred thousand. I also recalled again that while the percentage of infertility at Allentown was very heavy, the percentage at Corry was not so great. Also that while the spawning season at Allentown was in October, the spawning season at Corry was in the spring. I also remembered other curious circumstances connected with the Allentown property which together with the experience at Corry gave me a right to feel that the Allentown experience might be isolated.

I further took into consideration the fact that in other hatcheries California trout spawned in the spring or after the eggs of the brook trout were well advanced in incubation. If I had the pond room there would be practically no expense in resuming California trout work excepting for the food required and the cost of distribution. I had the pond room at Bellefonte and there was prospect of pond room in the near future at Corry.

Taking all these things into consideration I decided to give the California trout another trial. In 1903, I obtained several thousand fingerlings from the United States and assigned them to Bellefonte. From the moment they were put in the pond they did well. They grew rapidly and in December they spawned for the first time. The spawning was a little earlier than I hoped, but was two months later than at Allentown. The eggs at Bellefonte of the brook trout were all hatched or nearly all hatched and so did not take up much valuable room.

At that hatchery therefore the resumption of California trout work seems to have been justified. In the spring of 1905, I obtained eggs of the California trout from the United States Bureau of Fisheries hatchery at Leadville, Colorado, and they are doing remarkably well in the ponds at Corry. Whether they will spawn in the spring or in the winter cannot be determined until 1908. We shall have from the Bellefonte hatchery very nearly 300,000 fingerling California trout to distribute this spring, and in order to give a better test than in former years, these fish will nearly all be planted in Centre, Clearfield and Union counties.

GOLDFISH FOR PUBLIC SCHOOLS.

I have long been a believer in developing among children an interest in fish and their protection. A child who has had instilled firmly in its mind the truth that no fish should be killed, excepting for some useful purpose, and has been made to understand that fish should be protected, will likely, when he becomes a man, be a faithful supporter of the fish laws and an advocate of fish protection. In addition the ways and habits of fish are interesting and especially attractive to children. Therefore, I have believed that school children should receive instructions in matters relating to fish through what is known as "Nature Study" lessons, and that the lessons be illustrated by living specimens.

There are very few fish which can be retained for any great length of time in ordinary aquaria, but the goldfish is one. Hence, two or three years ago I advocated the propagation of goldfish for distribution among public schools and for public fountains. The movement met with great favor among the educators. The greatest difficulty I had to contend with was the cold water of the hatcheries, where we were compelled to first attempt the propagation of goldfish and from fish-eating birds. Further, goldfish make a particular shining mark for cranes, herons and king-fishers. Consequently the number of goldfish which were hatched in the beginning was very small and did not begin to meet the public demands. With the establishment of the new hatcheries, however, for miscellaneous fish, the first of the difficulties has been overcome. Most of the work will be concentrated at the Torresdale hatchery, where there is now a large stock.

The manner in which the Department came into possession of the goldfish now in the ponds at Torresdale is unusual, and revives an old and interesting story of the introduction of this species in the waters of the Schuylkill and contiguous ponds. One of the wardens attached to the Department, Warden George D. Shannon, of Philadelphia, last Spring came upon some men using a net in an old clay pit which had become filled with water. The men in using the net were guilty of a technical offense and Mr. Shannon, as in duty bound, put a stop to their work. On examining their catch he was surprised to find a large number of plain American goldfish from six to eight inches long, and further investigation showed that the old pit was literally alive with them. He immediately communicated with the Department, and acting under instructions the goldfish were netted from the hole and taken to the Torresdale hatchery. They numbered over 1500. Other pond holes in the neighborhood were also found to contain this pretty fish in greater or less quantities. Investigation showed that the original stock in these ponds came about in the following manner. Many years ago an American naval officer brought a number of goldfish from Japan and gave them to his wife, who had a place on the Schuylkill near Conshohocken. They increased rapidly, and for several years the pond was the resort of many admiring visitors. Then a storm came, the dam breast broke away and the fish escaped and in a few years became abundant.

Children would catch the brilliant creatures and place them in the water filled clay pits near the river. Some time (and this is well authenticated) children and grown people would find goldfish frozen in floating cakes of ice in the Schuylkill river during the early spring freshets. They would carry the ice containing the fish to some of the ponds and place them there, and when the ice melted gradually the liberated fish would thrive and in course of time have progeny.

OTHER WORK IN FISH CULTURE.

In addition to the work which was done at the hatcheries in the direction of propagating fishes which have long been a care of the Department and the experiments and work with California trout, cut-throat trout, pickerel, yellow perch, black bass, frogs and goldfish, a beginning has been made with several other minor game and food fishes. This was especially the case with rock bass, sun fish and cat fish.

I have long felt that there was a number of so-called minor fishes which should be propagated on a larger scale. For years, almost the whole attention of the fish culturists were given to raising brook trout and then the shad, white fish, lake herring and wall-eyed pike. I believe it was right to give attention to these fishes. They are high grade and deserve to be propagated to the fullest extent; but I have long felt that there is a class of streams whose needs have been overlooked and in which suitable fish should be planted.

For several years a large class of our citizens have very properly demanded rock bass, sun fish, cat fish, pickerel and yellow perch. The last two as heretofore stated are now being propagated on a large scale, and I am now taking measures for the propagation of the others.

The propagation of rock bass, sun fish and cat fish has been carried on perfunctorily at the hatcheries for the last two or three years, but I ordered that ponds in certain of the hatcheries should be set aside or constructed exclusively for these fishes. There is now one at Corry for sun fish and rock bass, and three ponds at Torresdale for all three. They were started too late last season to accomplish very much, but several thousand fish were hatched and distributed of each species.

I have made plans for the building in 1906 of a huge pond at Torresdale covering about three-quarters of an acre for the sole purpose of rearing sun fish and rock bass. Of the first named, there will be two species cared for, namely, the large river sun fish and the blue gill. The first reaches the weight of about one quarter of a pound and the latter from three quarters to a pound in weight. The blue gill sun fish has a distinct value in the markets, and should be generally introduced throughout the State. At present it is confined chiefly to Lake Erie and waters east of the Alleghenies.

A pond at Torresdale and one at Wayne are now devoted to catfish

and bull heads. During 1906 other ponds will be built on the new hatcheries for these fishes, and I hope to be able within two years to supply all demands for these fishes.

STURGEON CULTURE.

One of the very difficult problems for fish culturists to solve is the propagation of sturgeon. Several years ago, the late Dr. Ryder and Mr. Livingstone Stone experimented on the artificial propagation of river and lake sturgeon and proved it possible to hatch the eggs. Some action is of first importance for the reason that this exceedingly valuable food fish is threatened with extinction. The number of fish caught in Lake Erie annually is scarcely worth recording. The price of caviar has risen from \$10 a keg to as high as \$130 a keg.

The catch of sturgeon in the Delaware river has been cut down to one-half annually for the last ten years, until now it was rare for the fishermen to operate their nets to a profit. Several attempts on the part of the United States, Pennsylvania, Delaware and New Jersey, each on their own account, and New Jersey, Delaware, Pennsylvania and United States in Co-operation, to secure eggs of the sturgeon for propagation purposes have failed. The co-operative attempt which was made about five years ago was begun too late. Indeed, the chief obstacle in all attempts had been to secure ripe males and females at the same time. If by chance a ripe female was found there would be no ripe male caught within a reasonable time with which to fertilize the eggs. It also has been a curious fact that more ripe females have been found than ripe males. Most of the latter were either green or they had got rid of their supply of milt and were what is known as spent-fish.

Early this winter I had a series of conferences with Commissioner Bowers, of the United States, Commissioner Morris, of New Jersey and Commissioner Luff, of Delaware, in regard to another united attempt to hatch sturgeon in the Delaware river. The conferences were very satisfactory. Each Commissioner expressed a strong desire to make a determined joint attempt, and the following proposition was being seriously and favorably considered at the close of the calendar year: That the work of hatching any sturgeon eggs that might be gathered should be done by Pennsylvania and by its superintendents at the Torresdale hatchery and the fish hatched to be planted by Pennsylvania.

The United States Bureau of Fisheries to send its steamer, Fish Hawk, into the lower bay and assign Captain Herron, an expert in sturgeon work, to take general charge of the spawn takers.

Delaware to furnish a large launch and spawn takers and station in the lower bay, following the gilliers in that locality for the purpose of watching for ripe fish and securing the eggs and milt.

New Jersey to furnish spawn takers and a launch to be located in the neighborhood of Bay Side for the same purpose.

The moment any fertilized eggs are secured, a telegraphic dispatch to be sent to the Superintendent at Torresdale hatchery, who would immediately dispatch the Department's launch down the river to meet the up coming launch containing the eggs.

I have no doubt that this plan will be adopted and carried out the spring of 1906.

SHAD WORK FOR 1906.

I am also pleased to announce the practical decision on the part of New York, New Jersey, Pennsylvania and the United States to unite in shad work on the Delaware river in 1906. Somewhat different arrangements than those of 1905 have been agreed to. The whole shad work on the Delaware river is to be under the control and direction of Pennsylvania through its superintendent at Torresdale.

The United States is to furnish five or six spawn takers, New York four spawn takers, New Jersey two spawn takers, and Pennsylvania from four to six spawn takers, who are stationed from Bay Side to Trenton, and all the eggs taken are to be sent to the Torresdale hatchery. Although those taken in the lower river and bay may be eyed on the steamer Fish Hawk.

Pennsylvania is to bear the cost of and hatching the eggs, and New Jersey is to plant the fish. United States and States to pay their respective spawn takers' salaries.

Pennsylvania is to use its Department launch for collecting spawn from the spawn takers, and New Jersey to use its patrol launch for the same purpose whenever possible.

MUSCALLONGE CULTURE.

There are many anglers in Pennsylvania who have been urging the Department to take up the culture of muscallonge. Similar requests were frequently made of the old Fish Commission. Both the old Fish Commission and the Department have been anxious to obey their wishes, but there has hitherto been an insuperable difficulty in the way, namely, to secure eggs and a stock from which to propagate. Besides there was some apprehension on the part of the Department as to the wisdom of a general introduction of the muscallonge, because of its well known voracious habits. It is a huge fish, sometimes reaching a weight of 100 pounds, and its ordinary weight is from 15 to 30 pounds.

There are comparatively few waters in the eastern part of Pennsylvania in which it would be proper to introduce the fish. The

muscallonge requires a large body of water and an immense amount of food. In the western part of the State, especially in Conneaut Lake, Conneauttee, Lake Le Bouef and other lakes in Western Pennsylvania, a species of the muscallonge known as the Chataqua muscallonge is found in some quantities, but not sufficiently so to gather eggs from.

I finally decided to undertake muscallonge work if it were possible to secure eggs. The Hon. J. S. Whipple, Forestry, Fish and Game Commissioner of New York, has generously agreed to furnish me with several thousand Chataqua muscallonge eggs in the spring of 1906, and the Minnesota Fish Commissioner has also generously offered to allow my superintendents to get as many eggs as we desire of the true muscallonge, from the lakes of that State, and further have offered their assistance. The favorable response to my request of these two States was so prompt and warm hearted that I scarcely know how to express the thanks of the Department adequately. It is my purpose when the eggs are received to hatch them this spring at the Corry and Union City hatcheries, and to reserve a certain number of fry to raise to breeding age in the ponds at the hatcheries, and to plant the remainder in Conneaut Lake for the purpose of making that a great breeding ground in the near future. I have selected Conneaut Lake on account of its proximity to the new Crawford county hatchery, which is only half a mile from the foot of the lake.

SMELT WORK.

Among the estuary fishes, the smelt occupies a very prominent position. Its flesh is very delicate and it ranks high in the market as a food fish. New York has been entirely successful both in hatching this fish and in introducing it into Lake Champlain and other fresh water lakes of New York State. In fact in fresh water the smelt not only appears to make himself perfectly at home but to reach a larger size than in brackish water, its natural habitat.

The smelt is wonderfully prolific; a fish weighing only two ounces will yield from 46,000 to 50,000 eggs, and it is said that in natural spawning fully ninety per cent of the eggs are fertilized.

On account of this wonderful fecundity, the high esteem in which its flesh is held, the apparent ease with which it can be propagated, its proved ability to accommodate itself and increase naturally in fresh water, and the need for abundant fish food, I felt it my duty to undertake the propagation of this work as quickly as possible. I, therefore, approached the New York Commission on the subject and as in the case of the muscallonge, we met with a cordial reception. I have been promised at least 1,000,000 eggs of the smelt for 1906. The only conditions are that I shall send a spawn taker to gather the eggs at the Long Island hatchery, and to give New York a few thousand fingerling brook trout from one of our hatcheries. To these very liberal terms I instantly agreed. Subsequently, the

New York Commission added to its generosity by giving permission to my superintendents to take 1,200 or 1,500 or more smelts of spawning size to our hatcheries for the purpose of retaining them there as breeders. This generous offer has also been accepted.

FISH AND EGGS FROM THE UNITED STATES.

Arrangements made several years ago between the United States Bureau of Fisheries and Pennsylvania, concerning the gathering of eggs of the Lake Erie fishes and were continued in 1905, and are to be continued in 1906. Under the arrangements, the United States gathers all the eggs of the white fish, lake herring and wall-eyed pike in Ohio and other waters of Lake Erie outside of the jurisdiction of Pennsylvania. Pennsylvania was to receive a pro rata share of the eggs collected with the United States and Ohio, the basis being the capacity of the various hatcheries. Pennsylvania pays its pro rata share of the expenses, which amounts to about \$1,800 a year.

This arrangement is far more satisfactory in every way than the old method of each going into the field and competing for the eggs. It assures further a more regular and a larger supply, because as far as the white fish are concerned, at least, the United States has means to impound the fish which is not possible for Pennsylvania, at least under existing conditions. I am happy to say that further arrangements were also made with the United States this year by which there was an extension of the agreement to other species of eggs. The United States facilities for gathering lake trout eggs are much superior to those of Pennsylvania and the field wider, and last year by the new arrangements the Department of Fisheries obtained six million and a half of lake trout eggs from the United States by merely sending messengers after them to the United States Hatching Station at Northville, Michigan.

SALMON FOR THE DELAWARE.

Arrangements have also been concluded with the United States for a liberal supply of salmon eggs for hatching and planting in the Delaware river for a period extending over several years.

In former years I have pointed out the possibility of making a great salmon river out of the Delaware, and in other portions of this report I have gone into the matter extensively. Since writing that portion of this report, the United States Bureau of Fisheries has suggested that on account of the great difficulty in securing eggs of the Atlantic Salmon, an attempt be made to introduce the silver

salmon into the Delaware. Attempts were made several years ago to introduce the Quinnat salmon of the Pacific coast into the Delaware but with no success. At the time there was little hope of success, hence there was no disappointment when failure followed. It was felt that the character of the waters of the Delaware was not the same as those in which the Quinnat salmon naturally thrived.

The United States Bureau of Fisheries, however, pointed out that the silver salmon, while smaller in size than the Atlantic or Quinnat, spawns nearer the sea and in warmer waters, consequently, there is reasonable hopes that the silver salmon might be introduced into the Delaware. In order that the experiment may be thorough, the United States Bureau of Fisheries has agreed to furnish from 500,000 to 1,000,000 eggs every year for the next five years. If there is success, the supply of eggs is to be continued indefinitely and possibly increased in number.

TROUT EGGS FROM PRIVATE HATCHERIES.

I have already made mention of the fact that certain commercial and private hatching establishments had given their surplus trout eggs to the State. Referring to them particularly they were, with the number of eggs, as follows: Penn Forest Brook Trout Company, 2,000,000; Charles Wolters, Jr., 2,000,000; Col. Henry Trexler, 1,500,000; Blooming Grove Hunting and Fishing Club, 300,000, making a total of 5,800,000 eggs. This means that the gentlemen who gave these noble gifts made it possible for the State to add at least 4,730,000 young trout to the output of the State. Some of those named gave of their surplus eggs in 1904, and they have all indicated their intention of giving their surplus eggs to the Department in 1906.

For this generosity I wish to express the warmest thanks of the Department. It is a bright example of several instances which clearly prove the deep interest which the people of the State are taking in the work of fish culture.

GATHERING WILD TROUT EGGS.

It is of the utmost importance that the blood of breeding fish in the hatcheries be changed frequently. Imbreeding if continued very long is apt to produce many evils, among the worst of which is a lower vitality. The Fish Commission had a startling evidence of this in its hatchery at Allentown. Unquestionably, the best method of frequently changing blood is to secure annually some wild trout, both males and females and cross the blood, taking wild females

and impounded males and wild males and impounded females. The gathering of a limited number of wild fish is not very difficult at the Wayne and Bellefonte hatcheries for the reason that there are natural streams all around them. We will also be able to pursue the same method at the new hatchery at Spruce Creek, Huntington county. By this means the Department was able to add 100,000 fish to the breeding stock last autumn at the Corry, Wayne and Bellefonte hatcheries and this year it will be possible to add about as many more. As a result in three years from now the stock in all the hatcheries should contain nearly all breeders with wild blood in their veins.

GATHERING EGGS AT LAKE ERIE.

Before 1905 there was never any perplexing questions to be considered in regard to gathering eggs of lake herring from Lake Erie within the jurisdiction of Pennsylvania; but a different condition of affairs existing in the last year has required different arrangements. Under an act of the Legislature passed at its last session, a close season on all net fishing in Lake Erie was declared between November 15 and March 15.

From November 15 to the closing up of the lake by ice is the height of the egg taking season for lake herring, and the Department was threatened with the loss of many millions of eggs. Finally, the Department decided to pursue the same course as the United States Bureau of Fisheries in such cases, and fortunately the Department was warranted at law under Section 3 of the Act of April 22, 1905. This section gives the Department of Fisheries authority to catch fish in Lake Erie at any time of the year with nets for the purpose of stocking other waters or taking spawn.

The Department then notified the fishermen that it would employ any boat and crew if they made application, and providing they had not violated the law relating to close season. It appeared that all the boats had quit fishing on November 15 with the possible exception of one. The owners or captains of the twenty-two boats made applications for employment. Among the twenty-two was a captain who had been arrested and charged by one of the State Fish Wardens with having fished during the close season. This application for employment was refused, the others were accepted or twenty-one. Of the twenty-one tugs all brought in eggs, excepting one, this boat having been put out of service on account of a break down on the first day.

The conditions of the employment were briefly:—that the men were to seek the best grounds for lake herring, and they were to take and fertilize all the eggs of the ripe fish which were caught. The eggs were to be taken very carefully and brought to the hatcheries at the end of each day. As compensation, the men were allowed to keep the fish which were caught and dispose of them. This being the method followed by the United States Bureau of Fisheries, according to my information. Twenty boats brought in

809 quarts of spawn, or 60,720,000 eggs. Unfortunately, whether through carelessness or inexperience some of the eggs were no good. Of the twenty boats bringing in eggs only seven brought in first-class eggs to the number of 366 quarts or about one-half of the whole. Five boats brought in 277 quarts of fair eggs, or both first class and fair 643 quarts. Eight boats brought in 166 quarts of bad eggs. There were none good furnished by these eight boats. Every one was as bad as they could be. It may have been only a coincidence but it seems to the Department suspicious that the boats which brought in the worst eggs got the greatest number of fish relatively. It is needless to say that these boats and their crews will not be employed next winter. Only those will be taken on which furnished good eggs in 1905.

For this action there is no one to blame but the crews themselves. They were warned in the beginning that there never would be again a general employment of boats, that only those would be employed next year which brought in the best eggs in 1905.

NEW HATCHING JAR.

I have not been perfectly satisfied with the hatching jars used in our various batteries. While each type unquestionably had good points, there seemed to me to be defects in each. One for example, while in my estimation and the estimation of the superintendents of hatcheries, had a perfect bottom which caused the eggs to work easily and uniformly had two undesirable features. One was that it was difficult to clean and the other that it was very easily broken. It also did not carry as many eggs as it should, when the total height of the jar was taken into consideration. The second type held a pint to a quart more eggs and could easily be cleaned. But the eggs did not work as uniformly owing to a different style of bottom from the first type. In order to work all the eggs, a stronger force of water was necessary, which was very apt to "pound" the eggs at the bottom of the jar. Further, owing to the shape, the jar could not be set close to the peculiar type of battery in use in the hatcheries, hence, it became necessary to lengthen the lip by tying tin troughs thereto, this was of course unsatisfactory. While the jar did not break as easily as the first mentioned type, it nevertheless broke too easily for perfect satisfaction. A third type, of which there were a few, gave such poor general satisfaction that its discarding was determined on long ago, as soon as the last one should have been broken. It had very few good points.

At the urgent request of the superintendents I undertook to devise a hatching jar which would meet the undesirable features of those which we had in use and apparently I have succeeded. I have designed a jar having the bottom, like the first mentioned type with a top like the second and with generally a uniform width from bottom to top. Also with a longer lip. I have also got rid of the

stem which connected the other types of the jar with the foot and had the foot set against the bottom. This it is hoped will overcome the objectionable breaking feature.

Before ordering any quantity, sample jars were placed in each hatchery having batteries and subjected to very severe tests. The superintendents reported that they stood them all completely, and further that the jar would hold a pint more eggs than any other jar in use. I verified reports of the superintendents by personal observation at each one of the hatcheries and then, satisfied that it met the requirements, I installed the new type in the battery at the Wayne hatchery, to the number of 200. Hence, the jars will be again subjected to a very severe test with pickerel and yellow perch, and if they successfully stand it, they will be installed in the other hatcheries as occasion arises. If they do not, they will be discarded.

I should say that I have not applied for and do not intend to apply for a patent. The design I consider belongs to the State since it was designed while in the performance of my duties as Commissioner of Fisheries. The superintendents requested permission to name the jar and they have named it after the designer.

FISH CULTURISTS SCARCE.

The Legislature having authorized new hatcheries, it has become incumbent on me to seek capable fish culturists to take charge of them. Among the assistants, in the different hatcheries, there were only two who by years of service and attention to work had become capable of filling the position of superintendent. I found then that there were no other fish culturists in Pennsylvania, excepting those who were already employed in commercial or private hatcheries. I was forced therefore to seek elsewhere. I found that there were very few out of a position anywhere in the country, but it did not take me long to find that a number of very bright young men thoroughly equipped and employed in hatcheries elsewhere were eager for positions in Pennsylvania. I had no difficulty whatever in securing three men who I believe meet all the requirements of our work. More can be secured if necessary, but as I have above stated for the present at least, they must come from beyond the border lines of Pennsylvania. By the time we require more, I hope that some of the young men of Pennsylvania who have taken up the work of fish culture in the State Fisheries will have equipped themselves for the position of superintendents. I believe they will, for of the six or eight which entered the employ of the State within the last three years all exhibited enthusiasm and intelligent application.

FREEZING TROUT.

Every year nearly there goes up a cry all over the State that owing to the very severe preceding winters most of the trout in the streams have been destroyed by ice or low water. I have seldom

paid any attention to this, because I have always believed that trout is a more sensible fish than it was given credit for being. That in case of low water it knew enough to get into deep pools before its escape was cut off. I also believed that freezing was not as destructive as generally imagined, however, the wail in the beginning of 1905 was so general and so emphatic and accompanied by such circumstantial description of the streams being frozen to the bottom everywhere in the State, that I decided to make tests as to the ability of a trout to withstand being frozen in the ice.

The tests were conducted by the superintendents of the Corry, Bellefonte and Wayne hatchery; at Corry, old weak fish were taken; at Bellefonte, two-year olds; at Wayne, fingerlings and yearlings. The tests were of the utmost severity. Those at Corry and Bellefonte were placed in a tub of water which was then allowed to freeze solid. Those at Wayne were similarly treated in buckets. They remained frozen solidly for two weeks and the ice was then gradually thawed by steadily pouring spring water on them, the thawing required a day or two or more. The Corry fish were all dead and had evidently died within a few days. The Bellefonte fish were all dead but one, but they had evidently lived longer than those at Corry. Of the six fish at Wayne, four were alive and within a few hours appeared as lively as though they had not undergone any unusual experience. One had evidently died within a day or two and the other had been dead for a longer period.

Under no circumstances could the fish in the streams have been subjected to such severe tests, and it may therefore be considered as proving conclusively that very little damage could be done the fish by freezing in an open stream, however, shortly after, the matter was definitely settled in another and even more conclusive manner.

At the Wayne hatchery, there was a small pond in which there were several thousand young trout, in some manner on a very cold night, the water supply was checked and the water in the pond was frozen to the bottom. There wasn't a single fish which escaped being surrounded by and confined in ice. They remained in this condition for several days, when on the coming of a thaw, the water supply was reintroduced and the ice gradually melted. The superintendent reports that every fish recovered, not one died. With the test made artificially and the one just mentioned, it may be accepted by anglers hereafter that no concern need be felt regarding the safety of fishes in the streams, no matter how severe the winter may be. The question might be asked why the large fish at Corry and the medium fish at Bellefonte should have died, while the young fish at Wayne survived. Of course it is impossible to answer the question definitely and without its accuracy being challenged. It is possible, that when the fish were frozen, the air sacs in the fish did not contain a full supply of air. When that was exhausted, the fish frozen in the ice would probably die, they could scarcely secure a fresh supply while frozen solidly in the ice, although under the circumstances the amount of air required to sustain fish life would be infinitesimally small. It does not necessarily follow that fish frozen in the ice would themselves be frozen.

LOCATING NEW HATCHERIES.

By an item in the general appropriation bill of 1905, three new hatcheries were authorized, for the hatching of bass and other fishes. And by an act of the Legislature, approved May the 11, 1905, a fourth was authorized, this to be an auxiliary to the hatchery in Erie city. The last was speedily located and as already stated in the report, is now in active operation, with nearly 5,000,000 lake trout eggs hatching therein.

As soon as spring opened I began to search for suitable sites. I felt that one of these hatcheries should be somewhere in the western part of the State, a second in the southern part and a third somewhere in the east. After inspecting many sites, I finally settled on one in Crawford county at the foot of Conneaut Lake. The land is nearly level in fact I should have preferred a greater pitch as it would have made pond building easier. The greater part of the water supply comes from Conneaut Lake and it is regular in volume and suitable in temperature for the propagation of brook trout and warm lake fishes.

Citizens of Crawford county, especially of Meadville, interested themselves in the location of the hatchery and purchased necessary land to the amount of 25 acres, which they presented to the State. The deeds are now in the possession of the Commonwealth. The property was secured too late in the season to begin work, and as the man who I have appointed superintendent is required to overlook the shad work in the Delaware, ground will not be broken until the first of June, 1906.

Many sites in Southern Pennsylvania were offered, most of which would have made good hatchery sites as far as water and land was concerned. Finally through the efforts and assistance of Judge B. Orlady, of the Superior Court, the Department secured a splendid site in Spruce creek, Huntingdon county. There are nearly 30 acres having a good pitch and the lower end is only three minutes walk from Spruce creek station on the Pennsylvania Railroad. The lower end of the property is also not more than 500 feet from the Juniata river. A good road runs along one side of the new hatchery grounds. Another road, not in good condition, extends nearly the whole length of the other side. In the upper end of the grounds there is a fine spring of water flowing about 1,000 gallons a minute and a temperature of 50 degrees. The stream therefrom flows down one side of the hatchery grounds at the foot of the mountain. Spruce creek a very large stream, fully 50 feet wide in places flows through the grounds at the other side. The spring run and the creek meeting in the center of the property about two-thirds the way down, as a barrier against washing, there is 200 feet of woodland on the mountain side of the hatchery which is included in the property. As in the case of the hatchery at Crawford county, it will not be possible to begin work there before June 1st.

I am very sorry to say that I have not yet been able to locate the third hatchery. I found one very fine locality, but unfortunately before it was possible to secure the portion desired, a citizen stepped

in and purchased the entire property and so prevented the establishment of a hatchery. If the Department of Fisheries possessed, as it should the right of eminent domain, this cutting the Department out of a hatchery site which would have been of great interest to the State, could not have happened, and I hope that included in the next message to the Legislature will be a recommendation that the right of eminent domain could be given the Department of Fisheries. I hope that we will be able to the coming year, select a third site. I believe it will be possible to do so, for I already have three or four locations in view.

PROPOSED TRI-STATE HATCHERY.

At the last session of the Legislature a Commission was appointed under a joint resolution consisting of two members of the Senate, three members of the House and the Commissioner of Fisheries to meet with a similar Commission appointed by the State of New Jersey to secure uniform laws relating to fish on the Delaware river, subsequently, a joint meeting was held at Easton with a Commission of New York State, at that meeting, the Hon. Henry F. Walton, Speaker of the House of Representatives of Pennsylvania, during an address proposed the establishment of a great hatchery on the upper Delaware river, to be conducted and operated jointly by Pennsylvania and New Jersey. The proposition met with instant and unanimous approval. This was followed by the adoption of a resolution without dissent, directing the Commissioner of Fisheries of Pennsylvania to confer with the Forestry, Fish and Game Commissioner of New York and the President of the New Jersey Fish and Game Commissioner, with a view of formulating a plan by which the idea of Speaker Walton might be carried out.

Acting under the instructions thus given, I subsequently met the Commissioners named and a rough plan was agreed upon, subject to approval of the Attorney Generals of the three States. It is hoped to have the plan perfected and the bills for introduction into the Legislature of New York, New Jersey and Pennsylvania, in the winter of 1907.

INTEREST EXHIBITED BY RAILROADS.

The railroad companies exhibited a lively interest in the work of stocking the streams within the Commonwealth. This is particularly true in regard to the planting of trout. They were among the heaviest of the applicants and in all, called for very nearly one million and a half of fish of different species to be planted in the public streams in the State.

The lively interests which the railroads are showing in restocking our streams is very gratifying to me, for I recognize the fact that their example cannot but have a wholesome and far reaching effect for good and incite individuals to take even a more enthusiastic attention to planting suitable species of fish in public waters.

In addition the railroads have, as in former years, offered every facility for the quick transportation of the fish, often issuing special orders to the baggage men, directing them to render every assistance to the messenger. In addition as in former years, they transported the fry and mature fish free in the baggage cars.

In addition to the assistance which the railroads rendered in planting fish and by transporting them to the stations nearest their point of destination, many have rendered efficient service in protecting the waters from illegal fishing, several of the companies have notified their detectives and police to keep a watch for illegal fishermen and report them at once to this Department. One company now has under consideration the propriety of asking the Department to commission its detectives and police as special fish wardens, a request which naturally I would gladly grant.

I wish to express here my hearty appreciation for their practical exhibition of public spirit.

FISH PROTECTIVE ASSOCIATION.

Since the formation of the Department of Fisheries there has been a rapid increase in the number of Fish Protective Associations in all parts of the Commonwealth and a livelier interest exhibited by those previously organized. Membership in these associations have, so I am creditably informed, increased materially in a number of them. Some new organizations formed this year and I had the pleasure of being present at the organization of two and I was much impressed with the earnestness evinced by those forming them as well as with the enthusiasm they displayed in their determination to enforce the right of the fish laws and to do their utmost to increase fish life in Pennsylvania waters.

A large majority of the organizations in the different counties have warmly supported the interest of a State Fishery Association and the good effects thereof are already apparent.

Several of the organizations, both new and old have requested the Department to appoint several of their members Special Wardens, and the same organizations pledged their members to report to these wardens every case of illegal fishing which might come under their notice. If the associations in the State follow this plan, illegal fishing in Pennsylvania will soon be reduced to a minimum.

I cannot speak too strongly in favor and praise of organizations for the protection and planting of fish or of the formation of a State association of clubs. With County Associations and the State Association working in harmony with the Department, the cause of

fish protection must advance with giant strides. I feel under the deepest obligation to the county organizations for the help which they have rendered the Department; for the cordial backing which they have given and for the unselfish putting aside of local feeling in favor of the broad interests of the whole State.

I would like to emphasize the necessity of having some sort of an organization in every county in the State. It is not necessary that it be large, although the larger it is the better. If there is no regular county organization, I would suggest that if no greater number can be had than three or four men in a county interested in fishing, get up at stated intervals, in a semi-organization to discuss the angling interest of the county and for the purpose of furthering them. These three or four men could ally themselves with State Fisheries Associations and keep in close touch with the Department of Fisheries. A gathering of this kind, small though it might be in the beginning, would so attract public notice and cause a swelling in the ranks and a regularly constituted Fish Protective Association follow.

STATE FISHERIES ASSOCIATION.

In my last report I gave extended attention to the organization by the Department of a State Fisheries Association, having for one of its objects the assistance of the Department of Fisheries in its work of both fish protection and fish culture. I regarded the initial gathering at which the Governor made an address of welcome of such importance that I included the proceedings as an exhibit in my last report. The second annual meeting was held in June at the Bellefonte hatchery in Centre county. Its proceedings were, if anything, more important than those of the preceeding year. Earnestness and a determination to give the fullest assistance to the Department and to advance the work of fish culture and fish protection to the furthestmost limits were evident in every day's proceedings.

A number of important resolutions effecting the work were adopted and one or two referred to future legislation. One of the most important in this respect is the proposal to introduce a bill at the next legislature to authorize the Commissioner of Fisheries to set aside extended small creeks in Pennsylvania as nursery streams in which it shall be unlawful thereafter ever to catch trout. The enactment of such a measure would unquestionably greatly advance the trout angling of the State. The proceedings of the Association which were furnished the Department by the secretary will be found attached to this report.

FISH CAR.

I regret to say it is seldom that it is possible to use the fish car for distributing fish. The railroad companies insist on charging a uniform rate of 20 cents a mile for carrying the car in both direc-



Fish Car No. 1 "Pennsylvania."

fish protection must advance with giant strides. I feel under the deepest obligation to the county organizations for the help which they have rendered the Department; for the cordial backing which they have given and for the unselfish putting aside of local feeling in favor of the broad interests of the whole State.

I would like to emphasize the necessity of having some sort of an organization in every county in the State. It is not necessary that it be large, although the larger it is the better. If there is no regular county organization, I would suggest that if no greater number can be had than three or four men in a county interested in fishing, get up at stated intervals, in a semi-organization to discuss the angling interest of the county and for the purpose of furthering them. These three or four men could ally themselves with State Fisheries Associations and keep in close touch with the Department of Fisheries. A gathering of this kind, small though it might be in the beginning, would so attract public notice and cause a swelling in the ranks and a regularly constituted Fish Protective Association follow.

STATE FISHERIES ASSOCIATION.

In my last report I gave extended attention to the organization by the Department of a State Fisheries Association, having for one of its objects the assistance of the Department of Fisheries in its work of both fish protection and fish culture. I regarded the initial gathering at which the Governor made an address of welcome of such importance that I included the proceedings as an exhibit in my last report. The second annual meeting was held in June at the Bellefonte hatchery in Centre county. Its proceedings were, if anything, more important than those of the preceding year. Earnestness and a determination to give the fullest assistance to the Department and to advance the work of fish culture and fish protection to the furthestmost limits were evident in every day's proceedings.

A number of important resolutions effecting the work were adopted and one or two referred to future legislation. One of the most important in this respect is the proposal to introduce a bill at the next legislature to authorize the Commissioner of Fisheries to set aside extended small creeks in Pennsylvania as nursery streams in which it shall be unlawful thereafter ever to catch trout. The enactment of such a measure would unquestionably greatly advance the trout angling of the State. The proceedings of the Association which were furnished the Department by the secretary will be found attached to this report.

FISH CAR.

I regret to say it is seldom that it is possible to use the fish car for distributing fish. The railroad companies insist on charging a uniform rate of 20 cents a mile for carrying the car in both direc-



Fish Car No. 1 "Pennsylvania."

tions. Thus, to take a load of fish to a point one hundred miles from the hatchery would cost \$40.00 or for two hundred miles, one hundred miles for carrying the fish and one hundred miles for bringing back the empty car.

The appropriation of the Department would not permit such an expenditure at least, to the extent of using it regularly for the delivery of fish. For the greater part of the year therefore it remains in the car barn on the hatchery at Bellefonte. It is only employed when it is necessary to run fish from one hatchery to another.

REMOVAL OF CARP.

There was a great and incessant demand some years ago for German carp for the Pennsylvania waters. The demand was from fishermen, farmers and others. To-day there is as strong, if not stronger demand to devise some means to get rid of the fish, probably no species whether indigituous or introduced is so greatly anathematized as the German carp. It is unquestionably inferior as far as food qualities are concerned, and it is decidedly an undesirable fish because of its spawn eating habits, of its rooting up water plants, thus destroying shelter for young fish and food for fry, and also because of its keeping waters in which it may be continually muddy.

Unfortunately there is every reason to believe that the extermination of the carp is impossible, that it is with us to stay. Undoubtedly the number can be reduced and during the year, I made some effort in that direction.

Acting under section 29, of the act of May 29, 1901, I appointed a number of authorized representatives to capture carp by means of nets, a fairly accurate report of catches were made to the Department, and it appears during the year there were 29,905 carp caught in this manner. If it were possible to carry this method on generally throughout the State, I have no doubt that the number of carp would be speedily reduced. Most of the 25,000 fish reported were taken from the Delaware river and its tributaries near its mouth.

FISHWAYS ERECTED.

Several fishways were added during the year, all at the expense of owners of dams, with the exception of one. I had intended to build a nest of fishways in the dam on the Susquehanna river at Muncy and in the dam on the Susquehanna river at Williamsport, but other duties intervened and prevented. I succeeded, however, in having one built in a dam on Pine creek in Potter county.

Numerous petitions had been sent to me to erect a fishway it being stated that the dam was so high that no fish could possibly ascend. A large pool below the dam was, so it was claimed, frequently alive with fish endeavoring to pass up to spawning grounds. An investigation proved the truth of the declarations of the petitions. I therefore ordered the construction of a Cail fishway in the dam, the moneys therefrom to come out of unexpended balances as provided by section 13 of the act of May 29, 1901.

I advertised for bids and awarded the contract for \$1,750. It required four weeks to build the structure. It consumed 127 perch of stone, 27,000 feet of lumber, \$95 worth of iron spikes and a quantity of other material. The total length of the fishway is 39 feet, with a width of five feet inside measurement, a depth of five feet and a pitch of one foot in four and one-half. It contains five compartments so arranged that fish can either leap over or pass through. The total width of the fishway including side wings is 20 feet and it required a cut in the top of the dam from two to three feet and in the bottom from four to four and a half feet. Under the specifications, the contractor was required to so construct the fishway that the original strength of the dam would be maintained. An inspector recommended by the owners of the dam reported this part of the work to have been thoroughly done.

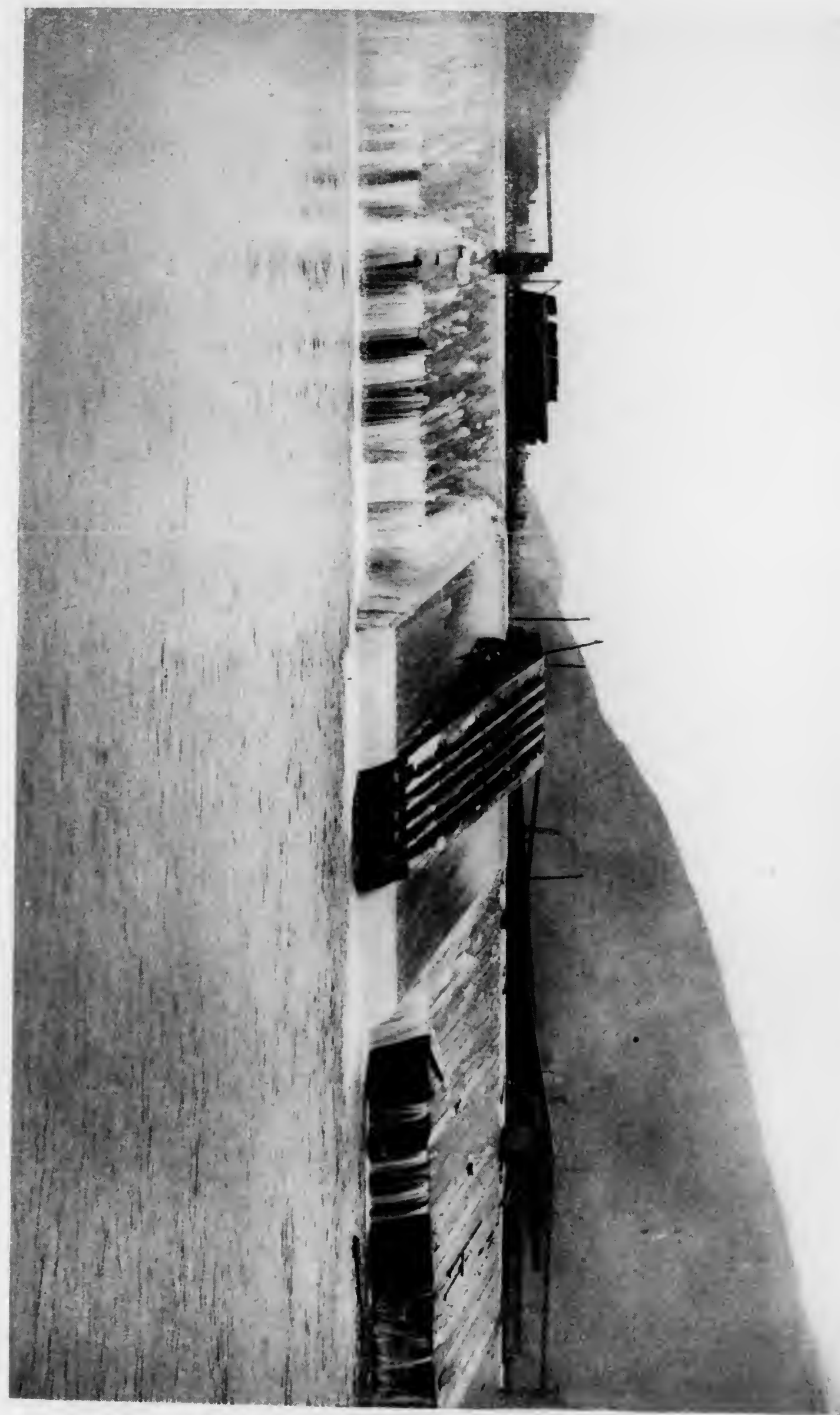
The success of this fishway is unquestioned. Trout have ascended it freely since its completion.

PHILADELPHIA AND PITTSBURGH AS AIDS TO THE DEPARTMENT.

Both Philadelphia and Pittsburgh have given tangible evidence of its interest in the fish cultural work of the State. In 1904, Philadelphia turned over a quantity of land on the Delaware river at Torresdale for the use of a fish hatchery. During the year when it was difficult to secure labor it furnished a large number of inmates of the House of Correction to make some important improvements to the hatchery. The inmates began work early sometime in September and they remained until the ground froze to such an extent as to force a temporary discontinuance. Work will be resumed by the inmates in the spring according to assurances from the Director of Public Safety.

Pittsburgh also has taken a part in the fish cultural work of the State by some of its officials, including the recorder, inviting the Department to take what fish it might desire for hatchery purposes from some of the original ponds in the public parks of the city. The invitation was accepted and nearly a car load of useful fishes were taken to the Corry hatchery.

Fishway, Pine Creek, Galeton. Front View.



Numerous petitions had been sent to me to erect a fishway it being stated that the dam was so high that no fish could possibly ascend. A large pool below the dam was, so it was claimed, frequently alive with fish endeavoring to pass up to spawning grounds. An investigation proved the truth of the declarations of the petitions. I therefore ordered the construction of a Cail fishway in the dam, the moneys therefrom to come out of unexpended balances as provided by section 13 of the act of May 29, 1901.

I advertised for bids and awarded the contract for \$1,750. It required four weeks to build the structure. It consumed 127 perch of stone, 27,000 feet of lumber, \$95 worth of iron spikes and a quantity of other material. The total length of the fishway is 39 feet, with a width of five feet inside measurement, a depth of five feet and a pitch of one foot in four and one-half. It contains five compartments so arranged that fish can either leap over or pass through. The total width of the fishway including side wings is 20 feet and it required a cut in the top of the dam from two to three feet and in the bottom from four to four and a half feet. Under the specifications, the contractor was required to so construct the fishway that the original strength of the dam would be maintained. An inspector recommended by the owners of the dam reported this part of the work to have been thoroughly done.

The success of this fishway is unquestioned. Trout have ascended it freely since its completion.

PHILADELPHIA AND PITTSBURGH AS AIDS TO THE DEPARTMENT.

Both Philadelphia and Pittsburgh have given tangible evidence of its interest in the fish cultural work of the State. In 1904, Philadelphia turned over a quantity of land on the Delaware river at Torresdale for the use of a fish hatchery. During the year when it was difficult to secure labor it furnished a large number of inmates of the House of Correction to make some important improvements to the hatchery. The inmates began work early sometime in September and they remained until the ground froze to such an extent as to force a temporary discontinuance. Work will be resumed by the inmates in the spring according to assurances from the Director of Public Safety.

Pittsburgh also has taken a part in the fish cultural work of the State by some of its officials, including the recorder, inviting the Department to take what fish it might desire for hatchery purposes from some of the original ponds in the public parks of the city. The invitation was accepted and nearly a car load of useful fishes were taken to the Corry hatchery.

Fishway, Pine Creek, Galeton, From View.



A CAUSE FOR DEPLETING WATERS OF FISH.

It is not alway illegal fishing which depletes waters of fish life. Occassionally the law is responsible. A law which extends the open season for catching game fish to within a few weeks, say two months of the spawning season of such fish is wrong, because for at least that length of time before the eggs are deposited, the fish become ravenously hungry, especially the females, hence, by the countenance of the law, millions of unhatched fish are destroyed.

The rapidly diminishing supply of pickerel in many of our mountain lakes has been a matter of concern to me for several years, and knowing the facts stated above, I have endeavored from time to time to secure the enactment of some measure which would close the season for pickerel about November 1st, but I regret to say without success. It is quite natural that people who live in the vicinity of the mountain lakes, especially farmers who give attention to their crops during the spring, summer and early autumn are opposed to being deprived of the right to catch pickerel, their leisure period in late fall and winter, and not knowing the life history of pickerel thoroughly, would misunderstand the purpose of a shorter close season, and resist any enactment of the kind most strenuously. Pickerel begin to spawn shortly after the ice breaks. I have known them to deposit their eggs as early as the latter part of January, quite frequently in the early part of February, still more often in March, and the function usually completed before the middle of April. As above stated a few weeks before spawning season or as soon as the eggs in the ovaries begin to develop, the females are ravenous and will seize almost anything that looks like food and their hunger appears to increase as the period for depositing the eggs approaches. It is safe to say that 75 per cent. of the pickerel caught through the ice in January, are ripe females, which would within a very brief period have spawned.

In the latter part of October, 1905, I had a curious and interesting illustration of the soundness of the peculiar ravenous character of pickerel in the close approach of the gravid period and the preponderance of the number of this sex captured by hook and line. Having decided to undertake the propagation of pickerel at the Wayne hatchery, I secured permission from the Wildwood Club, to catch the necessary breeders from its pond near Maplewood in Wayne county, 135 fish were caught in one day and transferred to the hatchery ponds. When spawning time arrived it was found that out of the entire 135 fish, only nine were males, consequently, the eggs of over 100 pickerel in the ponds in the spring of 1905, were useless. Fishing for pickerel after the first of November therefore should be prohibited or at least ice fishing should be restricted to not more than three tip-ups to a man.

It did not take long after the organization of the Department to discover that if the waters of the State were to be restocked with fish, and kept stocked, the policy of protection must be rigidly carried out. To plant fish in streams where they will be fished out before they have attained the spawning age is simply paternalism of the

most glaring character. Yet it was very much in evidence that in many sections of the Commonwealth the trout planted in the spring were all fished out before they attained the spawning age, owing to the depredations of the violators of the law who spared no fish, no matter what its size. Many of the contrivances for taking fish were of the most ingenious description and most complicated workmanship. They were so constructed that nothing but the smallest minnow could escape them and streams were left almost utterly barren.

Knowing these facts the Department set to work energetically to organize a corps of wardens to put an end to these destructive practices and, at the same time, act as an auxiliary force of workers in the campaign of education, which the Department also inaugurated, to show unthinking people that the laws for the protection of fish are intended to benefit the public and not to deprive them of the right of fishing. It is this unwarranted popular prejudice that the fish laws interfere with the private rights of the public to fish that the Department has found the most difficult to combat. Many persons were found everywhere who insisted that their fathers and grandfathers had used certain destructive appliances to catch fish and yet there were always abundant fish in the streams, forgetting that years ago the population of Pennsylvania was numbered by thousands, while to-day it is numbered by millions, and the fishermen have increased in the same proportion. The Department soon discovered that a special fitness is required to make a good fish warden. He must be a man of good common sense combined with tact and education enough to enable him to grapple the intricacies of the law. Endowed with these qualities a little training makes him a valuable assistant in the work of the Department, not only in preventing illegal fishing but in demonstrating to the public that the protection of fish is to the interest of that same public. A large number of special wardens were appointed under the terms of the law, but after months of experience it has been found that the number of men who make good wardens is very limited, although it must be admitted that considerable preventive work was done by wardens who had no record of arrests but the knowledge of their holding the appointments scared would-be violators from doing illegal acts.

The result of the work of protection is at last beginning to show very gratifying results upon which the Department congratulates not only the fishermen but the public. In some sections, as a result of the efforts of the wardens, the pirates who have depleted the nursery stream of the diminutive trout have been scared from their nefarious work, and the public have been taught that the little trout in the nursery streams will, if protected, grow in size, become mature trout, and on reaching breeding age, help keep the streams stocked with fish and afford true sport to the angler. In the larger streams where the wardens have succeeded in doing much to put an end to illegal methods of fishing, especially gigging, the bass and other river fishes show in greater numbers than for years. There is really nothing which shows the importance of the protection of fish during the close season than the increase of bass, in for instance, the North branch of the Susquehanna. When a bass is nesting it stands guard over its nest and when it is suddenly approached by the man with the torch and spear, to whom all fish

are game, and the better the fish the better the game, the bass is a ready victim although the gigger proclaims loudly that he is only gigging for carp. The disproof of this statement is not more plainly shown than by the fact that his torch is rarely seen over the muddy water affected by the carp but rather over the clear water where the bass builds its nest or the swift current where wall-eyed pike, or the so-called Susquehanna salmon, abides. As well might the farmer kill the setting hens from their nests and expect to have broods of "peeps" as for people to catch fish during the spawning season and expect that the supply of fish will be kept up in the streams.

It is with much pleasure that the Department finds so many people awakened to the fact that close seasons should be observed if the supply of fish is to be kept up. Some time ago an energetic warden wrote to the Department that he was in trouble. A prominent citizen of his territory, an ex-member of the Legislature and an ex-justice of the peace, was the owner of a private pond that had belonged to his grandfather who had built the pond. The same grandfather had purchased some pickerel and stocked the pond with them. From these pickerel grew swarms of pickerel that not only stocked the pond but as the years rolled round the escaped fish had stocked the stream below. Because the waters were private and because the pond had been stocked by his grandfather, the owner insisted that he had a right to fish when and how he pleased. In pursuance with this claim he openly defied the law and fished for pickerel in the close season. The warden was a man of tact and, instead of precipitating a legal fight, tried to show the man the error of his ways. A special deputy was sent from the Department to see the man. Stubbornly the owner of the pond insisted on his rights to take fish as he pleased. His attention was called to the fact, which he readily admitted, that nine out of ten fish he was taking, for it was then the close season, were females. This fact had been noticed, he admitted, but no particular attention had been paid to it, yet when the matter was pointed out to him so plainly, he saw a new light and he learned for the first time that the egg bearing females, as spawning time draws near, become voraciously hungry and will take any bait, and that by persistent fishing he would soon take so many females from his pond that there would be nothing but males left which meant in time, a barren pond. No sooner was this fact impressed upon his mind than he became one of the strongest advocates of fish protection, his only complaint being that the Department was not disseminating more rapidly the valuable information which it had given him.

In some sections of the Commonwealth, the Department regrets to say, that the work of protection is not sufficiently backed up by public support and hence illegal fishing flourishes in spite of arrests and examples which the fish wardens are able to make. At Duncannon, on the Susquehanna river, for instance, there is a very large amount of illegal fishing during the close season and much destruction is done. Wall-eyed pike or Susquehanna salmon were taken last season by the hundreds of pounds and in spite of the utmost vigilance on the part of the wardens, it was almost impossible

to detect the law breakers. In some cases, where the wardens attempted to make arrests, mobs gathered and made all sorts of threats of violence to the officers of the law. Citizens, who would be offended if they were called law breakers, openly encouraged the violators of the law by purchasing the fish from the illegal fishermen, thus making the violation of the law very profitable business to the violators. If public sentiment would frown upon the law breakers and law abiding citizens refuse to encourage them by buying the fish, the business would become unprofitable and the fishermen would not take more than they could use themselves. One female wall-eyed pike was taken last spring which measured thirty-nine inches in length and contained thousands of spawn which, if she had been allowed to live, would have added thousands of fish to the river to give enjoyment to many an angler. It is true that complaints were received of illegal fishing at various points, like Duncannon from residents of the vicinity, but such is the reign of terror inaugurated by the law breakers that the informers were afraid to show themselves in the light of witnesses for fear of damage to their properties. This left the problem of detecting the law breakers in the act fully as difficult as if the information had not been received, for so flagrant were the violations that they were matters of common notoriety and the Department was well aware of them without the information of the home people.

The experience of the wardens in many cases has been exceedingly exciting but here and there ludicrous phases have developed. The hardened fish pirate is generally of the desperado class, one who regards the hand of the community as against him and therefore his hand is against the community. He is most frequently, in a certain sense, squatter, and like the squatter is jealous of what he claims or supposes to be his rights. He locates his various devices for taking fish in some part of a stream where his nature lore has taught him that fish are abundant, and he is prepared to defend that spot against the intrusion of all comers, even to the extent of using a gun. One man with an eel basket claimed all the river for at least a quarter of a mile, and several innocent fishermen, who had cast their lines into his so-called private water, were suddenly awakened from their dreams by the report of a shot and the whizzing of a rifle ball which told them plainer than words that they had better move to some less dangerous spot. When arrested one night in the act of illegal fishing this man set up a vigorous fight and badly disabled one of the two wardens who were trying to get him. He fully believed, as he insisted, that he was within his rights, for had he not so fished for many a year, while it was due to his prowess as a fisherman that many a family got their supply of fish, the purchasing of the fish thus encouraging the man in his illegal work the same as the receiver of stolen goods encourages the burglar and the thief.

On another occasion when the wardens were cruising down the Susquehanna they camped upon an island. During the night some owners of illegal devices they were ferreting out, sneaked up to the island and destroyed the boat of the wardens. Then with hilarious glee the destroyers of the boat related to the gathered newspaper men on the shore how they had marooned the fish wardens in the middle of the river, little thinking that in the crowd listening to their story were the same wardens who were gathering evidence to

convict the guilty parties, for the fish wardens had speedily taken measures to get ashore. At another time, in the darkness of the night, two other men eluded the grasp of a warden and got away. A few nights afterwards at a meeting called in Reading to protest against the work of the wardens, the two men detailed their escape and described the warden for the benefit of any others who, while breaking the law, might see him approach and thus escape from his clutches. Little did they dream that the warden in question was a quiet listener to their stories and was able to identify the tellers as the men who had escaped him and for whom he then swore out warrants. It was a case of telling a fish story and paying \$25 for the privilege instead of selling it to a sporting journal at so much a column.

The foreign element in the Commonwealth are among the most persistent violators of the laws. They use the most destructive methods and pay not the slightest regard to close seasons or the size of fish. Dynamite is their favorite method and a stream after they have dynamited it is almost as barren of life as the Dead Sea. No fish is too small to be taken by them; in one instance a warden caught three Italians with 200 sunfish out of season, the longest of which was an inch and a half. Accustomed as these foreigners are to the despotic rule of their own countries they regard the liberty of this country as license, permitting a man to do anything without regard to the private rights of others. Armed with fire arms they are not slow to use them when detected in law breaking. In cases where escape is easy the recognition of a criminal afterwards is almost impossible, owing to the similarity of the appearance of the members of a gang. Last spring an innocent man was fatally wounded by one of an Italian gang who thought he was a fish warden, because he was walking along a stream in the woods on his own property, while later on the real fish warden, of whose coming they had been warned, was shot through the shoulder by an assassin concealed in the bushes only a few yards away, the warden's life being saved by the pooriness of the marksmanship of the foreigner. On several occasions when a warden has tackled violators of the fish laws when all of them were in boats on the river there have been strenuous fights, and the warden has escaped from drowning only by his skill in swimming and his superior adroitness in the art of self defense.

It is pleasant to say, however, that with the exception of some portions of the Commonwealth the duties of the wardens are becoming less strenuous. Violations of the fish laws still continue, but the violators are more careful and pursue their trade largely in the darkness of the night, whose sombre robes they think will shield them from the argus eyes of the protectors of the law. This shortens the working hours of the law breakers and with less hours, of course, less fish can be taken, and this is in the line of protection. The growing public sentiment in favor of protection also deprives the violators of their market for illegally taken fish, because the decent citizen does not wish to encourage the law breaker, and the fear of detection on the part of others prevents the buying, for possession of fish is proof of violation of the law and subjects the possessor to a fine.

Too much credit cannot be given to some of the wardens for the

active and energetic way they have carried on their work. No hours were too long for them, no weather too severe and no dangers discouraged them. For a time they had to meet the discouragement of unfriendly magistrates and in some cases the frowns of judges of the appellate courts who dismissed their cases with scant measure of justice, but the Department has gone steadily forward and in every case almost has won a victory.

When lower courts decided against what the Department claims to be the plain meaning of the law appeals were taken, and the Department is glad to say that the upper court sustained the rulings of the Department. The most important ruling was that of the Superior Court in the case of the Commonwealth vs. Sechrist from Lancaster county. Sechrist operated a fish basket which did not comply with the provisions of the act of April 27, 1903, claiming that the act did not impose a penalty. This was the view taken by the courts of Lycoming county and Cumberland county, but this was entirely swept away by the opinion of the Superior Court, which stated plainly and clearly that the fish laws of the Commonwealth distinctly provide all the methods by which all the fish in the waters of the Commonwealth could be taken and any method that is not specifically permitted is illegal.

This opinion has greatly strengthened the hands of the Department, made the work of the Department more easy and the law plainer to the law abiding citizen, who now knows, when he wishes to fish, he must fish by a method and at a time distinctly specified by the law, and that of certain kinds of fish, no fish under a specified length can be retained. In this respect the act of May 29, 1901, is almost a model one, because it provides the methods by which fish can be taken and therefore leaves no doubt as to methods by which they cannot be taken. A law that prohibits certain methods by which they cannot be taken is confusing, and at the same time new methods may spring up which are equally destructive with those which are prohibited and which would require new statutes to prohibit. In such cases the new methods could continue to be used until the new Legislature met to enact new prohibitory laws.

Under the act of March 22, 1899, the constables of the Commonwealth are made ex-officio fish wardens and under that act they are as much required to report the cases of any violations of the fish laws as they are violations of any other laws. In very few counties have the constables been required to make such reports. In practice the Department has found that the constables with few conspicuous exceptions are utterly useless so far as the fish laws are concerned. Not a dozen constables in the Commonwealth have made arrests for illegal fishing or reported violators of the fish laws to the courts. This in face of the fact that it is their sworn duty to enforce all laws. In case of violations of the fish laws they receive \$10 for each conviction in addition to half the fine, which should be ample compensation for their time. If all the constables in the Commonwealth would exercise due vigilance, illegal fishing would become almost a thing of the past, although it is probable that the practice could never be entirely broken up. If, however, it could be made as dangerous as thieving the amount of illegal fishing would be so reduced that it would no longer be much of a factor in depleting the streams. To be sure most of illegal fishing takes

place at night, but the torch of the gigger or the lantern of a man who sets or raises his net or outline shows his whereabouts and if the pliers of nefarious schemes felt that the eyes of the constable of his district would likely fall upon him he would be less apt to ply his trade.

The Delaware river has been a favorite spot for illegal fishing of all kinds, but since the organization of the Department of Fisheries much has been done to break it up. The favorite plan of the breakers of the fish laws on that river, when detected, has been to flee to the shore of the opposite State, but thanks to the co-operation of the authorities of New Jersey and New York, this practice bids fair to be broken up. Some time ago an illegal sturgeon fisher flying from a Pennsylvania warden took refuge in New Jersey. A telegram notified a New Jersey warden who promptly arrested the violator "with the goods on him." He was shut up in a country lockup from which he made his escape the same night in his own boat. He returned to Pennsylvania, but found a Pennsylvania warden on his trail, so fled to Delaware, where he heard that a requisition had been asked for him. The out-look was like that of Noah's dove; no place to put his foot, so he surrendered to the Pennsylvania warden and paid his fine. This example had a very deterrent effect on would be violators.

On the Delaware river between New York and Pennsylvania, violators flourished. This fall Pennsylvania wardens were sent to Pike county and saw some violators of the fish laws in the act. Before they could capture them the violators fled to New York where they thought they were safe. On the information sworn out by the Pennsylvania warden the Governor of Pennsylvania granted a requisition on the Governor of New York, for the violators. This requisition was duly granted by the Governor of New York and the men were brought to Pennsylvania for trial. At the beginning, the men under the advice of their New York attorneys, were disposed to show fight but when they realized that the officials of the two greatest States in the Union were bent on enforcing the laws, they did the wisest thing, plead guilty before the justice of the peace and paid their fines. This example will serve to show that illegal fishing is dangerous in the upper Delaware river, and do much to bring it to an end.

During the year ending November 30, 1905, the wardens made 530 arrests of violations of the fish laws. Four hundred and thirty were convicted and 100 discharged. In five cases of discharges, the Department took appeals to the county court, in three cases took appeals from the county courts to the Superior Court. There were 89 appeals taken by the defendants from the decisions of the justices of the peace. The amount of fines imposed was \$11,992.50.

The last Legislature passed an act amending the act of April 17, 1876, in regard to summary convictions. The act of 1876 recited the words of the Constitution in regard to the summary convictions that either party might appeal upon consent of the appellate court upon cause shown. The act of April 22, 1905, repealed the constitutional provisions and allowed only the defendant to make an appeal upon giving bail as in case of a common misdemeanor. Under this act of 1905 the appeals have been largely multiplied and the cases sent to court where the grand juries complain of multiplication of petty

cases, which should have been settled before the justice of the peace. In all cases appealed under the act of 1905, the Department has moved that the appeals be dismissed on the ground of the unconstitutionality of the act of 1905 and the court of Lehigh county has already rendered an opinion that the act of 1905, "is too plainly unconstitutional to admit of argument." The court of Lebanon county has also declared the act unconstitutional. The Department believes that these opinions will be sustained by the other county courts and if it is not will take the matter to a higher court for a final adjudication. The repeal of the right of the Commonwealth to take appeals would leave the Department helpless in the face of adverse decisions by ignorant or prejudiced justices of the peace, while the ease with which the appeals can be taken has been the cause of the multiplication of appeals involving the Department and the tax payers of the Commonwealth in heavy expense. The plainest cases are taken to court where the witnesses must be summoned at the expense of per diem and mileage. The time of twenty three grand jurors is occupied in hearing the cases, nearly the whole panel of petit jurors is idle while one jury sits on the fish cases and all the witnesses summoned to be heard in other cases before the court must sit and wait while their pay goes on. These appealed cases, it will be readily seen, if the act of 1905 remains in force, will cost thousands of dollars which must be paid by the tax payers. This is a matter which appeals to the tax payers and the sending of such cases to court is against the policy of all the courts which desire that minor cases would be settled in offices of the justices.

It is not surprising that many defendants, even when caught in the act of fishing illegally, should appeal under the act of 1905. They had everything to gain and nothing to lose by taking such action. They had been convicted, and fine or imprisonment stared them in the face for their wrong doing. Without a dollar of expense to themselves, they could carry their case to the court of quarter sessions, on the chance that the grand jury would ignore it on the ground of its being trivial or possibly secure an acquittal from a sympathizing jury, or at most, a disagreement even in the face of overwhelming evidence of guilt. As evidence that some such sentiment sways defendants, it may be pointed out that of the 89 cases which were appealed, in nearly seventy-five per cent. there was no question of fact, the laws had been plainly violated.

In the smaller streams of the Commonwealth where the native fish, such as suckers, fall fish, red fins, the various minnows and cat-fish abound, the need of protection is sometimes the greatest because it is in those streams that the illegal fisher gets in his most damaging work. Stir nets, set nets and devices whose ingenuity and workmanship have excited the wonder of the wardens are used in large numbers. The users of these devices claim an inherited right to use anything, no matter how destructive, and in too many cases they have the sympathy of their neighbors who do not see that in the depletion of the streams by the use of destructive devices, they are deprived of their sport of fishing and their chances for a fish dinner.

Many of these devices are so destructive that nothing is left and the streams in which they are used are becoming barren of all kinds of fish life. Here the advantages of education are strongly shown.

The illegal fisher claims that the fish laws are for the benefit of the rich when the fact is that the rich angler would scorn to take any of the fish which are the native inhabitants of these streams. There is no enjoyment for such an angler to catch a cat fish, while he would utterly scorn to take a sucker, however, high the flesh of the fishes named may be. They are not classed as game fish, and therefore unworthy his attention or his money spending.

If public sentiment could be properly directed, it would not be long until nearly all the dwellers along these streams would see the advantage of allowing fish to be taken only by legal methods, for the streams would become repopulated and everyone would have a chance to get an old fashioned string of fish. In the illegal device, the law breaker captures possibly a respectable string of fair sized fish, while at the same time he destroys hundreds or thousands of small fish which, if they had been left in the water would have grown and would have become fair game for the persons desiring a change to a fish diet.

It is idle to talk of the abundance of fish in these streams in former days when there were no protective fish laws and then claim that the lack of fish is due to protective laws, because every person with sense knows that that is absurd. When the population of Pennsylvania was numbered by hundreds of thousands there were not nearly so many fishermen as there are to-day, when the population is numbered by millions, and the fish had a better chance of increasing and multiplying.

What protection will do in restocking small streams is shown in numerous instances where the dwellers along these streams have united to put an end to illegal methods and give the fish a chance. No fish are more prolific than our native fish and they have no more enemies in their habitat than they did in years gone by except the devices of the illegal fisher. As before mentioned in this report, if public sentiment will only assist the Department and the constables will do their full duty, there is no reason why the streams should not teem with fish as they did in years gone by.

The vast area of the Commonwealth, the almost countless streams and lakes and the lack until within the last two or three years of a decided public sentiment in favor of fish protective laws has made the work of protection much more difficult than most people would imagine. Owing to the small appropriation made for the payment of wardens, the greatest economy had to be practiced, and while this hampered the Department in its work it also sometimes had a reflex action which had a tendency to work for evil.

Irate fishermen would write to the Department complaining of illegal fishing and demanding at once that officers be sent to break it up. At the time the complaints were received it was probable that no wardens were available or else they were so far off that the expense was too heavy to warrant their being sent on the special errand. This would anger the complainants who would proceed to revile the Department and perhaps decline to take any interest in the matter or furnish any information when the belated warden, who was sent at the first opportunity to the spot, got there to investigate.

All sorts of appeals to the constables to enforce the law, in the majority of cases, not only failed utterly to induce the constables

to do anything but did what was more undersirable, enabled the constables to put the fish pirates on their guard. On various occasions the wardens from the Department found that the violators of the law had been tipped off by the constables and had gone to cover, but in such cases it was almost impossible to get strong enough evidence to convict the constable. In some cases, however, where the constables declined to assist the wardens or to take notice of flagrant violations of the law which were called to their attention, the Department swore out warrants for dereliction of duty and the fact that in those cases the constables were fined one hundred dollars has been a strong incentive to other constables to do their duty when called upon, as evasion of that duty would bring the penalties of the law upon themselves.

One of the best factors in aiding the work of the Department has been the local fish protective associations and the Department has used every effort to encourage the formation of such associations in every county in the State. Where such organizations exist they have proved great disseminators of education and by the interest of their members they have forced the constables to at least a perfunctory performance of their duties and this perfunctory performance has done much to scare off the law breakers.

Even if a man is not an angler himself, it is very likely that he is fond of fish or that some of his family are. Here, then, is an element that desires an abundant and cheap supply of a food which nature would offer freely if she only gets half a chance, and this element properly educated becomes the strongest advocate of protection.

Under the act of April 27, 1903, the use of fish baskets for taking eels was permitted in the waters of the Commonwealth. The act prescribed that the user of a basket must take out a license from the county treasurer and then construct his basket according to certain well defined methods. The act was drawn by the eel basket people themselves, and naturally the Department supposed that it embodied all their ideas. The work of the wardens soon showed that comparatively a small number of the users of the eel baskets were complying with the law in the third season after the enactment of the measure, although for the first two seasons all the requirements were reasonably observed.

While many insisted on using a basket without taking out a license a still larger number failed utterly to comply with the provisions of the law which requires the removal of the bottoms of the basket between sunrise and sunset. Upon these violators of the law, down swooped the wardens and the penalty of twenty-five dollars for using a device not specifically permitted by law was promptly imposed. Here the Department received its first check. Some of the convicted parties appealed to the courts on the ground that the act of 1903 imposed no penalty.

The court of Cumberland county in a mere dictum upheld this view of the case and decided with a curious idea of the meaning of words that an eel basket and an eel pot, according to some dictionaries, are synonymous terms, and the act of 1901 permits an eel pot. Such a decision brought a smile to every fisherman who knows there is no more similarity between an eel basket and an eel pot than there is between a fishing rod and a creel.

The court of Lycoming county and the court of Lancaster county promptly followed the opinion of the Cumberland county judge, and the Department was compelled to go to the Superior Court to have the tangle unraveled. The Superior Court, with great clearness, said that the act of 1903 does not provide a penalty, but none is needed as the act is a permissive one and any person who does not comply entirely with the permissive terms of the act is guilty of using a device not specifically permitted by the acts of Assembly. Hence under the act of May 29, 1901, a person not complying with the terms of the act of 1903 is liable to a penalty of twenty-five dollars.

This decision of the Superior Court has entirely cleared up the question of legal eel baskets, but it showed to the users of the basket that the act was not quite so liberal as they desired. An effort was made in the last legislature to somewhat modify the law but it failed of passage.

While the law abiding citizens use the eel basket for its legitimate purpose of taking eels, the law breaker uses it to take every fish that comes into it. These violations of the law are difficult to detect for a warden may watch for nights and no fishing will be done, yet let him omit for a night his watchfulness and the pirate gets in his work.

To punish the parties, the violator must be detected in the act else he pleads to the court that he took his game fish with rod, hook and line while he was watching his eel basket. In one case a man was caught coming from his basket with a bag full of game fish, not one fish in the lot showing marks of a hook, yet the court of Perry county failed to hold him and the fact that he showed fight and resisted the officer and was convicted thereof by a jury, only brought forth a mild reprimand from the court.

In some few cases the Department has strong reason to believe that users of eel baskets are every morning furnishing hotels and private families with game fish amounting in the aggregate to many pounds, yet it has been unable to catch the parties in the actual act of taking the fish. There is no one in the neighborhood who does not believe the fish are taken illegally, yet the fish find a ready sale among people who would scorn to buy stolen property and if a man was to offer them a horse and buggy at a suspiciously low price, but would at once turn him over to the police as a suspected horse thief. Yet the person who so purchases illegally caught fish is just as culpable as the person who receives stolen goods. He is no more nor less honest than the despised "fence" or receiver of stolen goods.

The user of the outline is always a great destroyer of the game fish for he baits his line with live bait whereby his catch is largely of the best varieties of game fish. There are so many ways of concealing a line that it is difficult of detection, and working as the wary pirate does, in the darkness of the night, it is difficult to locate him.

Especially destructive are the outline fishermen who use live bait during the spawning season of the game fish for at that time the females are extremely voracious, especially the pike perch or Susquehanna salmon. At some points these fish were taken last spring by the hundred pounds. Although the wardens were extremely active and were close upon the heels of the violators, they were unable to obtain the evidence that would convict without resorting

to means which the Department will not consent to. In such places the only thing for the Department to do is to abide its time and trust to the creation of a better sentiment among the law abiding citizens so that they will decline to purchase the illegally taken fish.

So long as the pirates find the business profitable so long will they keep up the trade in spite of the fact that in some of these bad spots the Department has succeeded in arresting an occasional law breaker who has been fined to the extent of the law.

It is on the trout streams that the Department has found the work of protection most difficult. These streams generally take their rise at some mountain spring and flow down through the forests, through jungles of laurel and rhododendron under fallen trees and among huge boulders which make them almost impassible recesses. Here in these little streams dwell what is called the hemlock trout, because the little trout take on the dark color which nature gives them as a protection in the dark and gloomy shaded waters. The dwellers along these streams insist that these hemlock trout are a species of their own and never grow to the legal size, citing their general appearance and color. Science says that there is but one species of trout, native to the Commonwealth of Pennsylvania, and that the hemlock trout are but yearling fish and if left to themselves, will, as they grow in size, go down to the larger streams where they take on the bright colors that they absorb from the spectrum of the sun, and it is as much a disguise from their enemies in the sunlit waters as the darker color was in the darker waters.

The violators of the law catch these little trout by the hundreds and from the nature of the country and the closeness of the undergrowth, it is almost impossible for a warden to get such an illegal fisher in the act. Catching sight of a warden, he has only to throw his pole into a clump of bushes to be followed by his creel and he stands forth as an innocent person who is simply studying the beauties of nature.

Much of the nefarious work is done before the open season begins and a number of these little fish taken in times past runs into thousands. The violator of the law is thoroughly acquainted with all the paths and ways across the woods and along the streams, while the warden is apt to be a stranger whom the violator must not suspect. The warden is thus handicapped by his lack of knowledge of the neighborhood, but the Department is happy to say that from the vigilance of its wardens, it has been able to badly scare off at least two of the most notorious violators of the law in the State, one of whom it is estimated, took several thousand trout the year before.

One of the most destructive methods of taking fish has been the practice in various neighborhoods of drawing off the dams and making up parties to come and take the fish. While, of course, a great many full size fish were taken there was in most cases thousands of small fish left stranded to die by the receding waters. At one dam where the water was let out for the amusement of a fishing party, it was estimated that over 200,000 small fish were stranded on the banks, and the odor from the dead fish being plainly perceptible for half a mile.

In several instances the wardens were able to make examples of the parties who practiced fishing in this way and it is now pretty well understood throughout the Commonwealth that this is a waste-

ful method of taking fish will not be permitted. The drawing off of the dam had been an annual event in some sections which attracted a crowd; the venders of lunches and the fakirs with badges turning out as if it were some fair or jollification.

On at least one event the illegal beer seller was much in evidence with his frothing fluid and hilarious fishers who gave away the story of the day's doings to the wardens were strong witnesses to the potency of the beer. Within a short time the number of applications for authorizations to draw off dams so that the fish may be protected made to the Department shows that the people are appreciating that the old lawless method will no longer be tolerated.

POLLUTION OF STREAMS.

The first settlers of Pennsylvania found the Commonwealth abounding in streams of pure water which teemed with fish. As the population grew and coal was discovered, Pennsylvania took rapid strides towards being the leading manufacturing State of the Union. The forests that covered the hillsides were transformed into lumber and the refuse sawdust was turned in to defile the streams. To the sawdust was finally added the refuse from the manufacturies, the tanneries, the acid works, the paper mills and the other manufacturing establishments, that brought wealth and power to the State. With that disregard of the future which has ever characterized the American, no effort was made to stop the pollution of the streams which threatened not only the health of the people but carried death to human and animal life and extinction to the fish.

In the minds of many people there grew up the impression that the streams are the proper sewers into which every waste material, no matter how deleterious, must be emptied. It is against this feeling that a fight must now be made. As science recognizes that water must be kept unpolluted, if public health is to be considered, so strong has this contention become that the last Legislature passed a bill creating a Board of Health, whose aid has been invoked by the Department of Fisheries. The Department of Fisheries recognizes that the manufacturing interests of the State are immense and everything which would tend to weaken them will meet with violent opposition. It also recognizes the fact that the fish industry is a valuable one, the annual sale of food fish amounting to millions of dollars, to which must be added the catch of the anglers and the moneys that those anglers spend in pursuit of their pleasure.

The problem of pollution is a knotty one, but the Department hopes that by tact and dissemination of information, much may be accomplished in preventing pollution in the future and finally public sentiment will be so educated that ample legislation will be secured to render the streams of the Commonwealth once more pure and undefiled.

Ever since the formation of the Department there has been a constant stream of letters complaining of the pollution of the streams.

Men write that streams which were once a joy and delight to the angler, and a source of cheap food to the dwellers on the banks, no longer contain a fish because of dumping poisonous matter into the waters by manufacturers of one kind or other. What use is it, write many to spend money to stock the streams with fish when the State permits the poisoning of waters so that no fish life can exist therein. From the trout stream regions comes a constant wail of damage done by sawdust, for since the denudation of the original forests, the methods for lumbering have changed and instead of the immense mills, the work is now largely done by small portable mills which are set up where a tract of timber is located and then to save trouble the sawdust is dumped into a stream so that it may be carried away. This sawdust, it is claimed, so befouls the water that the trout will no longer stay in the streams. The Department is constantly called on to invoke the law against the people who dumped this sawdust in the streams. But unfortunately the Department has been unable to find any law to meet the cases in question. A number of cases where the saw mill owners have been seen and the matter presented to them, they have abated the nuisance of their own accord. This is true also in the case of many other manufacturers and in some cases where the Department has threatened suit, under section 26 of the act of May 29, 1901, the manufacturers have agreed to discontinue the practice of running their refuse matter into the streams.

In the case of the tanneries the owners thereof have exhibited a most earnest desire to co-operate with the Department for stopping the pollution, and indeed many of them have offered to put in any appliance the the Department would suggest, provided the cost of instituting the plant would not be prohibitory. So far some of them have shown so much interest that they themselves erected ponds to prevent the escape of the drainage from the tanneries and extracted from the refuse every deleterious substance which they propose to use again in tanning at a tannery erected especially for that purpose.

Among the greatest sources of pollution are the coal mines from which is washed down immense quantities of culm that defile the river for miles, indeed so far down is it carried that fishing coal from the river is a profitable industry for many miles along the Susquehanna river. So large an industry is this coal fishing that strangers who visit Harrisburg and are told of the annual output are apt to regard it as a story from the Arabian Nights. This culm settles to the bottom of the streams and covers over the spots where the bass, sunfish and other fish make there nests. Bass and sunfish are especially neat and tidy house keepers and will build no nests were the culm is dropped. This evil, it is possible will in time be checked from the fact that the land owners along the streams have been winning suits against the coal mining companies for damage done to their lands by the culm, for of course at the time of floods the culm is carried over the lands along the streams and the only way to prevent this is to place the culm where it cannot be washed into the rivers.

Another course of pollution from the mines is the sulphur water and the Supreme Court has decided that until water can be made to run up hill there can be no way of stopping the running of mine water into the streams. The court says that coal is absolutely necessary for human comfort and happiness and it cannot be mined

unless the mines are kept dry. It might be well to mention here that in one of the United States bulletins, it is gravely stated, that this sulphur water is not really a pollution, as it unites with other deleterious substances and forms compounds which are harmless. However, that may be, the angler knows very well that he has very unsatisfactory luck in catching fish in that part of the river that is very strong with sulphur water.

At the last session of the Legislature, the Department of Fisheries made a strong effort to secure the passage of a bill which would gradually lead to the cutting off of the pollution of the streams. On one side it met the opposition of the manufacturers, who exclaimed that the cost they would be put to would be too much of a burden, and on the other hand, with the opposition of the people who were opposed to paying anything to help the manufacturers put in preventive plants. To these might be added a great many people who think or say they do, which is the same thing, that the streams are the natural sewers placed through the State to carry everything that might be thrown into them. The Department's bill proposed a middle course that seemed to be fair both to the manufacturers and the people. Unthinkingly, people exclaim that no one has the right to do that which imperils human or animal life, which is true but when those same people through their representatives in the Legislature have allowed a thing to go on a long time without interference they allowed the offender at least an easement for which, if it is of value, the courts have held the user is entitled to be paid.

The Department's bill provided in the first place that hereafter no new industry should be allowed to run any substance into the waters of the Commonwealth that is deleterious. This did not conflict with any vested rights and should commend itself to every person who desires to see the streams undefiled. A second section provided that when a complaint was made that the waters of a stream were being polluted it should be examined into by the Commissioner of Fisheries, the State Veterinarian and the Commissioner of the Department of Health, and if they all agreed that the pollution endangered human life and fish life and cattle, all three, then the nuisance should be abated at the joint expense of the owner and the Commonwealth.

Every dweller in the Commonwealth is interested in bringing about the purification of the waters of the Commonwealth. To the dwellers in the city the polluted water that comes to his house brings typhoid fever, while to the farmer and dairymen such pollution means death or deterioration to his live stock. It is now well established that anthrax, that terrible disease, was introduced into Pennsylvania through imported hides, the washings from which run into a stream. It was also established that the same stream gave the disease to human beings who worked in the water or used it for any purpose. There are numerous cases where the liquors which run from manufacturies are so poisonous as to sicken, if not to kill, the cattle and thus render the animals worthless as milkers or else they become sick and in a bad condition when they will not take on flesh. There are many streams in the State where the pollution is so great that not only will not a fish survive but even all the vegetable life is wiped out. It is impossible to believe that such a stream is not a menace to the public health.

The action of the tanneries not only shows the desire to respond

to the public sentiment that wishes to prevent the pollution of streams, but is really in the line of proper economy which strives to prevent the loss of anything that has the least commercial value.

The extravagance of Americans has long been a subject of comment, but the sharp competition which now prevails in all branches of business makes necessary the most rigid economy and the utilization of every product that has the slightest value and has heretofore been allowed to go to waste because it was not considered worth saving.

The utilization of waste products has been one of the reasons why the large slaughtering establishments of the west have been able to so largely control the sale of dressed meats, as has been said with almost absolute truth, nothing is lost of a pig except its dying squeal.

The saving of the waste products in the cotton seed industry has made these waste products almost equal in value to the cotton lint itself. The same is true in the corn industry where nearly every by-product has been utilized. Such being the case there is no reason why the manufacturers should allow any substance except pure water or water so neutralized as to be harmless, to escape. In Germany, at a manufactory of acids, not even the smell is allowed to pollute the air, let alone any substance that would pollute the water. The rigid economy of the German has taught him that there is money in every product that comes from his manufactory and he therefore saves everything and utilizes it in some way or other.

The municipalities of the State are preparing to put in filtering plants to purify the water and these plants will cost annually many thousands of dollars to extract from the water the poisonous substance that the manufactories run into the streams above the places where the municipalities take their water. It would seem plain to the average mind that this money now being spent for filtration plants could be used to better advantage in devising methods to prevent pollution of the streams, because when this pollution is stopped there would be no more need of the heavy annual expenditures to filter the water. The fact that the Commonwealth has permitted the manufacturing interests to use the streams as sewers has probably given the manufacturers vested rights for which the courts will allow them compensation. It will, therefore, probably be necessary to have legislation which will meet this point; but even if the State does have to pay for stopping the pollution, it will be economy in the end as shown above. After the streams are no longer polluted, the water will not need filtration, it will not imperil public or animal health, and the streams can be again stocked with fish in such an abundance that they will be very important factors in supplying cheap and toothsome food for the people. In cases where the pollution has been so flagrant and so evident, the Department has evoked the aid of the law as provided in section 26, of the act of May 29, 1901. At Honesdale the gas company permitted the overflow of a tank which ran into a stream and poisoned fish by the thousand. Complaints poured into the Department which promptly ordered the arrest of the officers of the company who plead guilty, paid the fine of \$100 and promised that every possible step should be taken to prevent the recurrence of such a pollution.

In Montgomery county, a manufacturer was arrested for running

refuse in the stream which refuse was shown by chemical analysis to contain many poisonous substances which not only killed fish but also the live stock of the farmers who dwelt along the stream. The manufacturer was found guilty and sentenced to pay a fine of \$100. The Department has also brought other suits where the violations have been flagrant and these cases are now pending. The Department hopes to secure convictions. There can be no question that the securing of these convictions will have a deterrent effect upon other manufacturers and induce them to take measures to prevent any of their refuse from polluting the streams.

A prominent citizen of McKean county who has made a study of the subject of pollution, advised the Department that the pollution of so many streams in his county could be easily stopped by the expenditure of less than a thousand dollars. That is that amount would cover the necessary preventative plants for the manufacturers that are now polluting the streams. In view of this statement which he corroborates with figures obtained in Germany, it does seem as if the rights of the people who use water below a defiling source should have more consideration than they have. There can be no doubt that if proper methods are used that the substances now allowed to go to waste by many establishment can be made a source of profit, and in case where they cannot be made a source of profit, the little cost which would be necessary to prevent their contaminating the streams ought to be cheerfully borne by the owners of the manufactories. That this is so is shown by the number of people who have cheerfully ceased the polluting of streams when their attention is called to the matter.

It is very gratifying to the Department to find that many persons are willing to co-operate with it in this matter of pollution. This is essentially true of the railroad companies. Not long ago some one sent in the head of a large muscallonge which had been found floating dead on the Allegheny river and which, on examination, proved to have been killed by having its gills choked up with water slag. This slag, the informant said floated from some operations of the Erie railroad. A letter to the officials of the Erie railroad brought a prompt response thanking the Department for calling its attention to the matter and saying that the practice should be stopped at once, which it was. The officials in charge of the operations promptly issued a stringent order forbidding the water slag to be allowed to run into the stream and giving notice that any employee who permitted it would be promptly discharged.

Since then, which was over a year ago, not a single complaint has been heard from there. In addition to that the Erie railroad officials have advised the Department that they personally visited other establishments in the neighborhood and explained to them how the refuse was killing the fish and in every case the nuisance was entirely abated. This is given as an example of what can be done when the attention of public spirited people is called to an evil.

It is gratifying to say that in the case of portable saw mills not one operator in ten has refused to stop running saw dust into the streams when his attention has been called to the matter and the evil of it explained. Just here it might be added that in one case where a warden called on a saw mill operator at an old fashioned mill and told him that the neighbors complained of the saw dust killing the trout, he laughed at the warden and said:

"This mill has been here 90 years. My grandfather ran it, my father ran it and I have run it, and I will bet you that you can catch as fine a string of trout right here among the saw dust as in any stream you ever fished in."

The warden took him at his word, proceeded to fish, and in an hour landed six trout, eight and ten inches in length. Perhaps 90 years living in a saw dust loaded stream the fish had become hardened and rather liked it after the manner of eels which are said to enjoy skinning.

From the complaints of trout fishermen about saw dust defiling streams no longer containing trout, it would seem that the old saw mill owner does not have many people who believe the same with him. There is no question that in many cases, even if the saw dust does not choke the gills of the trout, it gathers on the bottoms of the streams and fermenting, gives off some substance upon which the fish do not thrive, to say the least.

A large paper mill was erected on the Juniata river during the past year and complaints flowed in to the Department that the mill was discharging chemicals which threatened to destroy all the fish life in the Juniata river and at the same time make the water unfit for stock to drink. The Department wrote a letter to Charles M. Schwab, who is largely interested in the mill, and stated the facts to him. A letter was promptly received from a representative of Mr. Schwab in which he stated that every possible appliance should be used to prevent the slightest pollution of the stream.

This shows that legislation, such as the Department proposes which would prevent new industries from running refuse matter into the streams, would not be a hardship because Mr. Schwab is willing to do so of his own accord, and he has to enter into competition with all the mills which were built years ago and which are discharging their refuse into the streams without having any expense of erecting or operating purifying plants.

In Bedford county an iron manufacturer on several occasions allowed refuse matter to escape from his furnace which destroyed fish by the thousands. A warden was sent to look up the matter and reported the case to be a flagrant one of pollution. The Department proposed to institute a suit, but the owner of the mill has since evidently made arrangements that are effective in preventing the discharge of the poisonous matter into the stream.

If in time the public sentiment can be educated up to the point of regarding the pollution of streams as a thing that should not be, there is no doubt that this sentiment would have a reflex action on the manufacturers. There is no man however independent, who can defy the universal public sentiment, and hence if the manufacturer knows that a universal sentiment is in favor of the prevention of the pollution of streams, that manufacturer will proceed to take steps to stop the running of refuse from his plant into the streams, because he would much prefer to have the good will of his neighbors to their ill will, even though that ill will is lightly disguised.

In a large city public sentiment is so educated that no one can allow any foul or noisome substances to remain in his yard where it will annoy a neighbor. There is no reason that there should not be the same sentiment all over the State in regard to the pollution of streams which would be strong enough to stop that pollution of

the streams the same as the pollution of the air is stopped in the cities.

INTERNATIONAL FISHING TROUBLES ON LAKE ERIE.

The fishing grounds on the Canadian side of Lake Erie have always been regarded as better than those on the American side. Moreover they are better maintained through the more stringent fish laws of the Dominion. The Dominion of Canada has invariably prohibited Americans from fishing in their waters and maintains a patrol boat to enforce its regulations.

Naturally many American fishermen have cast covetous eyes on the Canadian waters and, notwithstanding the danger, poached there whenever they had the opportunity. There are nearly 100 steam and sailing crafts registered in the city of Erie which are used for fishing purposes. It is safe to say that the owners or captains of the majority of the steam crafts, which number about 75, have taken chances against capture and resulting confiscation of boats on more than one occasion by venturing over the forbidden line for the purpose of catching fish.

Last fall the Silver Spray was chased by the Canadian patrol boat and was badly riddled with shot. Another boat was captured but was released afterwards on insufficient evidence, but the boat was in the forbidden zone when captured.

On September 12 the steam tug "Bertha E. Cockerell," Captain Thomas Post, was captured by the Vigilant, the Canadian patrol boat, after two shots had been fired.

On the 14th, the Steam tug "W. J. McCarter," Captain Frank Handby, escaped after being chased, but the boat was struck twice by shots from the Vigilant.

On September 15, steam tug "E. S. Oggel," Captain Bert Morrison, was captured by the Vigilant.

On the 17th, the steam tug "Harry G. Barnhurst," Captain Nick Frasel, escaped after a long and exciting chase during which thirty shots were fired by the Vigilant and the boat was struck repeatedly by bullets and several of the crew narrowly escaped with their lives.

There is scarcely a doubt that all the boats would have been captured had the Vigilant pursued them far beyond the line, and it must candidly be said it is to be regretted that they were not captured and their boats confiscated. The captain of the boats were violating the fishing regulations of Canada, regulations which Canada had a perfect right to make.

Consequently, any sympathy which might be expressed for any damage that was done would be wasted. Indeed, if newspaper reports are correct, Captain Frasel of the "Barnhurst" was candid enough to admit that he got all he deserved.

According to the newspaper reports he gave the captain of the Vigilant credit for more consideration than he, Captain Frasel de-

served. He is reported as saying "no man living could be fairer than he is, and I think that all the fishermen from this port realizes it * * * if Captain Dunn had been willing to sacrifice our lives he would have only had to say the word and one shot from his heavy gun would have sent us to the bottom. We were in the wrong and I think the captain treated us with great generosity. He has always been as kind to the fishermen of this port as his duty would allow him to be."

Naturally the Canadian Government is much concerned over the acts of piracy which are being constantly committed, and it is stated in the public prints that they propose to consult the home government and ascertain if it were not within treaty rights to increase the size of the gun on the patrol boat to a modern rapid fire three pounder.

The Canadian Fisheries Department also placed the entire question in the hands of other Canadian authorities.

The most deplorable, I may say the most reprehensible feature of this whole wretched business, is that the Dominion of Canada has been endeavoring for some years to secure some uniform legislation on not only Lake Erie but over all the Great Lakes which would be to all the fishermen of both nations as far as would be consistent with the proper maintenance of the fish supply.

But every effort on the part of the Dominion of Canada has been resisted by large numbers of the fishermen. I am happy to say that the Pennsylvania fishermen on Lake Erie have lately shown a disposition to at least partially meet the propositions of the Canadian government.

Two years ago I attended a conference composed of representatives of the Canadian Government and of the States bordering on the Great Lakes, and at that conference certain regulations for the future were recommended unanimously. The Pennsylvania fishermen agreed not to contest the greater number of these, but fishermen in some of the other states succeeded in defeating beneficent legislation and thus far concurrent laws and concurrent regulations are not in existence, although there is a prospect of some proper legislation this winter by Ohio and New York.

Some of the American fishermen with an affrontery which is astonishing appealed to the United States government when chased or captured or interfered with by the Canadian authorities, and the United States Government heard their cry and did interfere, but in a manner which was neither expected nor desired. It appears that when American fishermen go over the line into Canadian waters, catch fish there and bring them back into ports of the United States, they violate the tariff laws. As soon as the United States Government heard of the lawless proceedings and the appeals of the American fishermen, it sent the revenue cutter *Morrell* to the scene. It first proceeded to Pennsylvania waters and thence to Ohio waters where, on October 7, United States Collector of Customs, Charles Leach, confiscated a boat fishing in Canadian waters for bringing the fish in in violation of the tariff laws. A few days later the State of Ohio confiscated the launch "*Major Wilcox*" with a half ton of black bass aboard.

The failure to secure uniformity in fishery regulations on the great lakes is unfortunate, and as a consequence, such occurrences as those

described are bound to happen frequently. Moreover the chasing of American boats, their capture or being riddled with shot will most likely continue until the national government can be induced to make a treaty with the Canadian government or the States bordering on the great lakes or the national government the right to chase poachers over the line and secure their arrest and extradition as for other offenses against the laws. It will be only by such drastic treatment that fish piracy on the great lakes will be broken up.

CONCURRENT LEGISLATION FOR THE DELAWARE RIVER.

The Delaware river being a boundary stream between the states of Delaware and New Jersey, Pennsylvania and New Jersey and Pennsylvania and New York, it was long ago recognized important that there should be concurrent jurisdiction over and laws effecting that stream. As a consequence laws in the nature of a treaty were enacted in the early part of the last century. Under this treaty no state could enact any law without the concurrence of the other or without the two states passing laws, the effect of which were the same.

Occasionally one legislature or the other of the states would overlook this important requirement and consequently there would for a period be conviction. In 1889 New Jersey and Pennsylvania enacted laws relating to the fishing on the Delaware river, identical in character and New York adopted the same provisions in part. Delaware also about that time enacted laws which were in part the same as those of New Jersey and Pennsylvania. Later Delaware attempted to repeal one clause without reference to New Jersey and trouble immediately followed. The clause related to a close season for sturgeon. Subsequently in 1904, the New Jersey legislature passed a repealing clause. Pennsylvania, however, did not do so. New Jersey legislature at the time of repealing enacted a bill referring to fisheries on the Delaware river which conflicted materially with the act of 1889. In this Pennsylvania did not take any action. It therefore became my duty to remind the New Jersey authorities of the fact of the existence of the treaty, also to point out that Pennsylvania not having past similar acts to those of New Jersey in 1904, the laws of 1889 were the only ones enforced and that any fishermen operating in any part of Delaware above the southern line of Pennsylvania who fished under the laws of 1904 would be liable to arrests and punishment under the act of 1889. The newspapers at the time widely published the stand which I took, and most of the fishermen on the Delaware took care to fish only under the act of 1889. In fact the great majority of fishermen both on the New Jersey and Pennsylvania sides, north of the southern line of Pennsylvania appeared to favor most of the provisions of the act of 1889 rather than the provisions of the New Jersey law of 1904 which had been passed solely in the interest of the fishermen in Salem county, New Jersey.

A warden of the Department of Fisheries made one arrest of a man violating the provisions of the act of 1889 in reference to sturgeon fishing. He was convicted by a Philadelphia magistrate; but was subsequently discharged by the court for the reason that through an unexplained error, the magistrate in writing out his information made the charge under the section of May 29, 1901, effecting inland waters only instead of the act of May 22, 1889.

The man, who was arrested strenuously to the New Jersey authorities claimed to have been arrested on the New Jersey half of the Delaware river. Considerable correspondence passed between this Department and the New Jersey authorities, at the conclusion of which the latter withdrew objections when it was clearly shown that the man had been arrested on the Pennsylvania half of the Delaware river. At no time did the New Jersey authorities question the propriety of the arrest admitting that there was ground in Pennsylvania not accepting the validity of the New Jersey act of 1904 and insisting on the enforcement of the act of 1889. The only real point raised was that if the man had been arrested on the New Jersey half of the river, the warden should have taken the defendant to a justice in the State of New Jersey. This was admitted by me, but as I have already stated, I succeeded in demonstrating to the New Jersey authorities that the man had been arrested on the Pennsylvania half of the Delaware river.

This and the fact that the act of May 22, 1889 while excellent in most of its provisions did not wholly meet the necessities of the fishermen at the present time. A joint resolution was thereupon passed by the Legislature of Pennsylvania of 1905, authorizing the appointment of a commission to consist of two members of the Senate, three members of the House and the Commissioner of Fisheries to meet a similar commission appointed by the State of New Jersey to draft a concurrent bill covering the fisheries of the Delaware river; also to secure co-operative action with New Jersey in fish hatching on the same stream.

The Pennsylvania Commission comprised Senators A. E. Sisson and Arthur G. Dewalt, Representatives, Franklin March, John G. Harman, Charles L. Kline and myself. Henry F. Walton, Speaker of the House of Representatives, being, of course, ex-officio member. The personnel of the New Jersey Commission was Senators John G. Horner and Bloomfield H. Minich, Assemblymen Colonel John A. Wildrick, Theodore B. Gibbs, Thomas E. Hunt and John Boyd Avis, Speaker of the House of Assembly, ex-officio.

The first meeting was held in Philadelphia, Senator A. E. Sisson, of Pennsylvania, was elected chairman and Assemblyman Hunt, of New Jersey, Secretary, with Samuel Hudson as Assistant Secretary.

The joint Commission met in a very friendly spirit and each exhibited a strong desire to put a stop to the threatened complications. A rough draft of a proposed concurrent bill was submitted by the Pennsylvania Commission at the first meeting, and at the second meeting, which took place at Trenton the provisions of the concurrent bill were finally settled. I am happy to say that nearly every important point presented by Pennsylvania was adopted, while every provision of the new concurrent act might not meet with full approval by all fishermen on the river was yet a measure far in advance of anything presented before and as nearly perfect as

could be expected when the varied interest of the different parties of the Delaware river were considered.

At the meeting at Trenton it developed that there was a joint Commission between the State of New Jersey and Delaware, one object of which was the same as our own with New Jersey and the New Jersey Commission strongly urged that Pennsylvania take part with the joint Commission between New Jersey and Delaware. This request was seconded by an ex-official of the State of Delaware, who had been present at the first meeting. A few days later a letter was received from an officer connected with the Maryland Fish Commission asking for the co-operation of Pennsylvania in protecting certain game fish by passing one or two acts similar to those which were in force in Maryland. It was too late to take such action by the Pennsylvania Legislature then in session, but I at once notified the officer in question of the existence of the joint Commissions and advised him to have the Assembly in Maryland also appoint a Commission to meet with New Jersey, Delaware and Pennsylvania.

After a conference, the Pennsylvania Commission in making its interlocutory report advised that the life, power and scope of the Commission be extended to the Legislative session of 1907 in order that the fishery question might be discussed with New York, New Jersey, Delaware and Maryland. A joint resolution to that effect was introduced during the closing days of the session and promptly passed.

One of the special features of the concurrent bill adopted by New Jersey and Pennsylvania was a uniformity of mesh and season for catching fish with shore or haul and other nets excepting gill nets. The first to be two and a half inch stretched measure and all gill nets for all species of food fishes excepting herring to be five inches and sturgeon nets ten inches.

I was anxious that a small license fee, on nets should be imposed, not particularly for revenue purposes, but in order that the fishermen who secured licenses be protected against larceny of the fish from their devices. Under existing conditions, as fish belong to the State and not to the individuals, there is no law which will permit the punishment of a man for stealing fish from any net owned by another person. If, however, a small license fee were imposed, the State could then make taking fish from such a device a punishable offence, just as the State makes it a punishable offence to steal a licensed dog but ignores the stealing of an unlicensed one.

Unfortunately the fishermen, excepting on Lake Erie, are not yet educated to the advantages of a license fee; but I believe as soon as the principle is thoroughly understood, the fishermen themselves will be the first to come forward and ask for such fees to be imposed. The license system now in force on Lake Erie, when it was first inaugurated by the State, caused some dissatisfaction among the fishermen but they are now nearly unanimous in hearty support. They have learned that it is to their pecuniary advantage.

The bill drawn in accordance with the action of the Joint Commission was introduced into Pennsylvania's Legislature and passed both Houses. It was sent to your Excellency and to my great regret you felt impelled to withhold your approval on the ground that it was special legislation and therefore unconstitutional. The title of the

bill provided that it should affect rivers which formed a boundary line between this and another State. You very properly held that the Delaware river was the only stream which would be affected by the two, and could therefore only be considered as special legislation. You had other objections to the bill which impelled you to veto it. You strongly advised me before the next session of the Legislature convenes to place the bills in the hands of a constitutional lawyer, so that what is really necessary legislation may be legally accomplished. It is a course which I will gladly follow.

In November the Commission met again, this time in connection with a Commission appointed by the State of New York, and another bill drafted containing the same provisions but worded differently to meet the objections which were raised by the Governor of Pennsylvania. This bill to be introduced to the Legislatures of New Jersey and New York at the sessions of 1906, and will be presented at the session of the Pennsylvania Legislature in 1907, provided the bill passes the Assemblies of New Jersey and New York.

It is a matter of congratulation that in the bill agreed upon by the three commissions, there was only one which met any serious opposition from any of the members, and it is one that relates to a weekly close season for shad. All the members of the three commissions, save one, were strongly of the opinion that it was important that there be a close season for shad, beginning with Friday night and ending Sunday at midnight. Under the law of 1889, a close season began on Saturday at sunset and closed on Sunday at midnight. The members of the New York Commission were particularly insisting on a close season beginning on a Friday night, giving very strong arguments in support of their position. One member of the Commission of New Jersey, Assemblyman Hunt, of Salem county, argued strenuously against a weekly close season of such length. He advocated a close season not earlier than noon on Saturday, preferably sunset Saturday, and in the event of the latter being adopted, extend the close season to Monday sunrise. The remainder of his colleagues and all the Pennsylvania Commission's colleagues supporting the New York contention. It was pointed out that shad caught on Saturday morning were of little value and could only be sold at a price which would work injury to the fishermen themselves and also probable failures in many instances to sell at any price. A close season from Friday night until Sunday at midnight was held as nearly important as the artificial propagation of shad eggs, and it has become more important every year on account of the increasing number of nets, especially in the lower river, which injures the chances of the fishermen in the upper river. The Friday night provision was adopted by the Commission.

UNIFORM LAWS FOR THE GREAT LAKES.

In my last report I gave in some detail the proceedings of a conference between Fishery Officials of the United States bordering on the Great Lakes and of Canada to propose some measures affecting the fisheries of the inland fresh water seas. While every proposition

approved by the conference met with my hearty endorsement, I felt there were two or three which were either not adapted to the conditions around Erie or which could not be approved by the Legislature of Pennsylvania on account of strong opposition on the part of many of the fishermen.

The number of the propositions, however, was so small and of such insignificant character, excepting one, that with that one exception they are hardly worth considering. The one exception was a limit of size or weight proposed of different species of fish which might be caught. I felt it would be necessary to have this provision enacted after I had had a consultation with the leading fishermen and dealers of Erie.

The main features of the agreement reached by the conference pleased the fishermen and dealers, the more especially since they themselves had proposed one measure which was adopted unanimously by the conference, namely, a close season. Shortly after the convening of the Legislature I drafted a bill in accordance with the recommendations of the International Conference of Detroit and it passed the Senate without a single objection being raised.

Before going on the calendar of the House, however, some differences of opinion arose between the lake fishermen as to the size of mesh and the propriety of abolishing the trap net, consequently the bill was held in committee for a short period, and a hearing was given representative fishermen by Senator A. E. Sisson, Fishery Commissioner Hamberger and myself. The result was some amendments were agreed upon and inserted on the bill which then passed the House and was agreed to by the Senate, your Excellency subsequently appending your signature.

The chief new features of the new act governing the fishing on Lake Erie are making a close season for all kinds of net fishing from December 1 until March 15. Making the mesh of gill nets three inches stretched measure, and in all parts of the crib of pound nets two and one half inch stretched measure.

To prohibit the use of trap nets for a distance of fourteen miles from the mouth of Presque Isle Bay, and to make the amount of licenses on trap nets optional with the Department, not exceeding five dollars.

To prohibit the catching of more than 15 black bass each day.

As the International Conference had been so thoroughly advertised among the fishery officials of the States bordering on the Great Lakes, I was therefore much surprised to receive early in March a request from the Commissioner of one of the States to join a conference to be held in Chicago the early part of April, the object being to endeavor to secure some uniform legislation for the Great Lakes. As to date, April 10th was given. As the time was during the closing days of the session of our Legislature, I was unable to be present.

In October I received advice from Ohio stating that a bill similar to our own would be introduced into the Ohio Legislature during the winter, and in November at the Conference of the Joint Commission of Pennsylvania, New Jersey and New York, the last named agreed to report a bill with the New York Legislature on similar lines. Mr. Bastedo, the Deputy Commissioner for the Dominion of Canada, informed me that as soon as New York and New Jersey adopted the provisions of Pennsylvania, the Dominion of Canada

would follow suit by a decree of the fishery authorities of Canada. If therefore all this comes about, we will have for the first time uniform laws relating to the fisheries of Lake Erie.

RECOMMENDATIONS OF THE AMERICAN FISHERIES SOCIETY.

Among the very important organizations in the United States relating to fish culture and fisheries is the American Fisheries Society, a national organization. Organized thirty-four years ago, its membership is composed of the leading fish culturists in the country, the leading members of the United States Bureau of Fisheries, and most of the State Fish Commissions. Its utterances therefore are entitled to be received with great weight and respect. At the last meeting of the association held at White Sulphur Springs in July, 1905, there were two resolutions adopted unanimously, and if, as is recommended, the various States concur therein, a mighty advance in fish protection will have been accomplished.

To Prevent Pollution.

The first resolution refers to the pollution of streams and reads as follows:

Whereas, The attention of the American Fisheries Society has repeatedly been called to the rapid increase in the wholesale destruction of fish by means of illegal nets and other devices; by dynamite and by the pollution of the streams from sugar beet factories, tanneries, chemical works, wood pulp factories and other manufacturing establishments, and by sawdust; and

Whereas, The American Fisheries Society regards with grave apprehension this wholesale destruction of an industry, the first value of which is upwards of seventy-five millions of dollars, and to preserve which few legislatures have taken adequate measures; and

Whereas, It is patent to this Society, that under existing conditions it is difficult for artificial propagation of fish to keep pace with this destruction; therefore, be it

Resolved, By the American Fisheries Society, assembled at White Sulphur Springs, West Virginia, this 26th day of July, 1905, that the legislatures of the several States be requested to enact such measures, without delay, as will prevent further destruction of fish life, particularly by laws forbidding the taking of undersized fish and the destruction of spawn by improper use of nets, and by legislation forbidding further pollution of the waters; and be it further

Resolved, That the Secretary of the American Fisheries Society be, and he is hereby, instructed to send a copy of this preamble and resolution to the Governor of each State with a request that he

transmit the same to the legislature of his particular State when assembled.

I cannot give the resolution just quoted too strong an endorsement. I have dealt with the question of water pollution at length elsewhere.

Federal Control of Waters.

The second resolution is rather startling in its proposition and it reads as follows:

Resolved, That the American Fisheries Society, assembled at White Sulphur Springs, at this thirty-fourth annual convention, wish to heartily commend the efforts that are being put forth to have the differ States cede to the National Government any jurisdiction they may have over the fisheries of the Great Lakes and interstate water forming the boundaries between said States. And be it further

Resolved, That this Society most heartily commends the efforts of Representative Shiras, of Pennsylvania, in his efforts to secure the passage of a federal law regulating the fishing on the Great Lakes forming a boundary between this country and Canada. And be it further

Resolved, That this Society pledges its membership individually and as a society, to get their respective Congressmen and Senators committed to the support of this measure.

I have been given to understand that Representative Shiras and others who are advocating the passage of the federal law regulating the fishing on the Great Lakes do not propose that State sovereignty shall in any wise be encroached upon excepting in so far as relates to the enactment of laws relating to the method and time of catching fish in the lakes. I asked a United States Government official interested in this movement if the enactment of such a measure would interfere, for example, with the imposition and collection of license fees from boats and nets used in fishery operations on the lakes and the reply was that such was not the intention; that according to his understanding it was merely to the extent which I have mentioned. Neither did he think there was any intention to ask the State to yield the right of enforcement of the laws or to prevent various State Fish Commissions or Departments from freely gathering spawn.

Under these conditions it seems to me that the movement deserves serious consideration. I believe no action should be taken which would encroach upon the sovereign powers of Pennsylvania, but uniform legislation on the Great Lakes in regard to the fisheries is of vital importance. While the steps which have been taken by the States of Ohio, Pennsylvania, New York, and which met the approval of Canada, and if enacted by the States, will be followed by Canada undoubtedly, there is no certainty that all three of the States will for all time in the future continue uniform legislation. The action of the States named has been a great step forward, but Federal fishery regulations would be a greater step still.

PROPOSED DAM ON THE SUSQUEHANNA RIVER.

Early in the summer of 1905 announcement was made that a corporation had been formed composed chiefly of New York people to erect a dam across the Susquehanna river at McCall's Ferry for the purpose of the storage and transportation of water and water power for commercial and manufacturing purposes, and for the generation of electricity.

As the construction of such a dam would seriously effect the fishery interests of the Susquehanna and perhaps equally destroy them above McCall's Ferry, I at once instituted inquiry and found the report to be true. I ascertained that the title of the concern was to be the McCall's Ferry Power Company; that it is a corporation of the State of Pennsylvania, formed by the merger or consolidation of the Hillside Water and Power Company and the Susquehanna Water and Power Company, one in the township of Lower Chanceford, York county, and the other in the township of Martic, Lancaster county. That the two water power companies were incorporated by letters patent issued September 2, 1902, and that the consolidation and merger was effected by merger agreement filed in the the office of the Secretary of the Commonwealth April 11, 1905.

As far as I have been able to understand it is proposed by the company to build a concrete dam from the York county shore to the Lancaster county shore, thus completely spanning the Susquehanna river. Also that the dam would be between 32 and 40 feet high, thus backing the water for many miles and submerging land on each side of the river to a height of from eight to twenty feet. I ascertained that had purchased the land which would be submerged, and heard that the tracks of the Pennsylvania Railroad which would be submerged would be raised above high water by the consent of the railroad company.

The building of such a dam would unquestionably destroy every shad fishery from the breast of the dam for many miles up the river. It is not surprising therefore that the shad fishermen are up in arms against the construction of the dam. The Susquehanna river is one of the greatest natural spawning grounds for fish in the country. Originally, it was a far greater river for shad than the Delaware and fully the equal of the Potomac or the Connecticut.

The building of dams many years ago by the canal companies practically ruined the fisheries above Columbia. The destruction a few years ago of the dam between Columbia and Wrightsville and of the dams on the Juniata river caused the shad once more to ascend the first named stream as far as Clark's Ferry and the Juniata river even into the Raystown branch. Year by year the shad fisheries improved until they had once more become reasonably profitable and there was every prospect that before many years the shad fisheries within Pennsylvania would be worth several hundred thousand dollars a year and the equal of the same fisheries in the Delaware.

If the dam at McCall's Ferry is constructed, it would mean if not the complete wiping out of the shad industry, its reduction to

narrow limits, for the natural migration of the fish up the stream beyond McCall's Ferry would only be possible by means of fishways. It is a well known fact that of all the fishes, the shad is the most timid and it hesitates about going through any type of fishway which has yet been designed. The more courageous, it is true, pass through, as has been evidenced by the fishway placed in Clark's Ferry dam by the State, but the number which go through in comparison and those which refuse, is comparatively small.

I feel the shad industry ought to be developed, not destroyed, or even interfered with, even for the sake of the purpose for which the McCall Power Company proposes to build a dam. It is not merely a question of dollars and cents which has to be considered, but the right of the people to have within their reach a very valuable and important food commodity at little cost. In my estimation, no corporation, no individual, or set of individuals should be given the right to deprive thousands of food. The latter even though its money value be less than a given industry, is more essential to the community than the industry.

Suppose, for example, that the oft raised cry that great industries should not be prevented from operating because of the fish were universally carried out. There would then be no fish and an enormous industry aggregating hundreds of millions of dollars in the United States, and which is regarded as one of the great sources of wealth, would be completely wiped out. If it is proper to exterminate the fisheries where they interfere with manufacturing and other industries, then the same proposition can as logically be applied to any other individual food industry. At the demand of industrial enterprises, the beef industry might be wiped out or the grain industry. As a matter of fact, promoters of industrial enterprises have declared their inherent right to pollute the streams at the expense of cattle raising.

Doubtless, people who might advocate the construction of a dam across the Susquehanna river may hold that the industry, which will be developed thereby, will be more important than the fishery industry on the Susquehanna, but that will be a claim utterly without foundation and fact. The money invested by the company may exceed the money invested by the fishermen on the Susquehanna and its tributaries, although even that might be open to question, but its net earnings cannot possibly equal those which in a few years are certain to accrue to the fishermen from an open stream.

It is not merely the shad industry which would be destroyed, but the eel industry also. Within the last three years, since the legalizing of catching this species of fish and their valuable and important industry valued at thousands of dollars a year has been created and if not interfered with, it is safe to say that in five years it will rank among the most important of the special fishery interests of Pennsylvania.

The construction of the dam at McCall's Ferry would also wipe out this new and growing trade in a useful food fish. To understand how surely and completely this will be, it is only necessary to point out that the eel is a fresh water fish which descends the river annually to the sea for spawning purposes. The fish does not and cannot spawn in fresh water, hence the erection of a dam would prevent the mature fish and the young fish from ascending the river in the spring.

What is true of the eel and the shad industry is also true of a number of other fishes, the herring for example, which ascends for some distance above McCall's Ferry under present conditions. In dollars and cents the total loss to the people along the Susquehanna river would be, conservatively speaking, in the neighborhood of half a million dollars a year, but more important than the dollars and cents would be the loss of food.

Fishermen on the Susquehanna river have appealed to the Department to oppose the construction of the dam; but the power of the Department in this respect is restricted, and it can only act within the limits of the laws regulating fishing, and the fishermen themselves must therefore take the initiative and bear the brunt of the work of opposing the construction of the dam at McCall's Ferry. The Department will naturally and earnestly enforce every law which it can command for the preservation of the fisheries.

OFFICE WORK.

Since the establishment of the Department the work of the office has enormously increased. For the last six months it has been simply impossible, even by extending the working hours into the night, for the regular force to complete the work. Another stenographer is imperatively needed, and I will be compelled to ask for the appointment of an additional stenographer. More than fifty letters are written every day in addition to other typewritten matters which come under the charge of a stenographer and typewriter. The work has not only grown to great proportions, but it is continually increasing.

Before concluding, I desire to make a number of recommendations for action at the next session of the Legislature:

1st. The authority to employ an additional stenographer at the same salary which is now authorized under the law.

2. That measures recommended by the joint Legislative Commission be enacted to secure uniform fish laws between the States of New York, New Jersey, Maryland, Delaware, Ohio and Pennsylvania.

3d. That among the provisions in the concurrent legislation there should be an act prohibiting the catching of shad in the Delaware river from Friday sunset until after Sunday midnight of each week during the otherwise legal open season.

4th. There should be an enactment forbidding the sale of certain food and game fishes, notably bass and yellow perch of less than a designated size, no matter where caught or at what time of the year.

5th. There should be an enactment forbidding the sale of black bass, wall-eyed pike and chain pickerel, no matter where caught, during the close season.

6th. I strongly recommend that there be a small license imposed on all devices used for catching fish for the market and in return

to make fish caught in such licensed devices the subject of larceny, the moneys accruing from such license fees to be devoted to the uses of the Department of Fisheries.

7th. I strongly recommend the enactment of stringent legislation prohibiting the pollution of streams to an extent that destroys food fish and injures public health.

8th. That the Act forbidding Sunday fishing be modified or changed so that the Department may exercise some discretion in the enforcement thereof.

9th. That an appropriation be made sufficient to purchase a sea-going boat for patrolling and egg gathering purposes on Lake Erie.

10th. That the appropriation for warden service be increased to an amount sufficient to employ the full number of regular wardens authorized under the Act of May 29, 1901, and for other expenses incurred in the enforcement of the fish laws, and provided that in the case of regular wardens all the fines instead of one-half be turned into the State Treasury for the use of the Department of Fisheries.

11th. That the Department of Fisheries be given the right of eminent domain in case an amicable understanding cannot be reached between land owners and the Department for a property which the Department needs for fish hatchery purposes when such hatcheries are authorized by law.

12th. That the Legislature create a division of scientific investment connected with the Department of Fisheries with a head to be appointed by the Department of Fisheries.

The above is respectfully submitted.

W. E. MEEHAN,
Commissioner of Fisheries.

FINANCIAL STATEMENT.

The following is a statement of the receipts and expenditures of the Department of Fisheries for the year ending November 30, 1905:

Received from the State Treasurer for the hatcheries and general expenses of the Department,	\$20,625 00			
Balance on hand November 30, 1904,	5,079 19	\$25,704 19		
Received from State Treasurer under provisions of deficiency bill, act of March 10, 1905,		8,504 00		
Received from Lake Erie licenses for the year ending November 30, 1905,	1,555 00			
Balance from Lake Erie licenses, November 30, 1904,	293 01	1,843 01		
Received from fines for the year ending November 30, 1905,	2,938 72			
Balance from fines November 30, 1904,	564 45	3,503 17		
			\$39,559 37	
Paid for hatcheries and general expenses of the Department,				\$39,079 90
Received from the State Treasurer for the payment of wardens,	6,250 00			
Balance on hand November 30, 1904,	22 20	6,272 20		
Received from eel licenses for the year ending November 30, 1905,	896 45			
Balance from eel licenses on hand November 30, 1904,	284 09	1,180 54		
			7,452 74	
Paid for wardens during the year,				\$7,400 21
Received from State Treasurer on account of contingent fund for the six months ending November 30, 1905,			\$750 00	
Paid for incidental expenses,				\$527 65
New Hatcheries.				
Received from State Treasurer for auxiliary to Erie hatchery, act of May 11, 1905,			\$5,000 00	
Payment for building, ponds, etc.,				\$4,777 87
Received from State Treasurer for Torresdale hatchery, act of May 11, 1905,			\$767 12	
Paid for labor, etc.,				\$767 12
Received from the treasurer of Philadelphia for Torresdale hatchery,			\$5,000 00	
Paid for building, etc.,				\$4,150 00
Fishways.				
Received from State Treasurer for erection of fishways under provisions of section 13, act of May 29, 1901,			\$1,753 90	
Paid for fishway at Galeton,	1,750 00			
Paid for advertising proposals,	3 90			\$1,753 90
Total receipts for the year,			\$60,766 01	
Total payments for the year,				\$58,456 65

CORY HATCHERY.

Station No. 1.

Report of Superintendent Wm. Buller.

Hon. W. E. Meehan, Commissioner of Fisheries:

Dear Sir: I take pleasure in presenting my thirteenth annual report of the operations of the Corry hatchery. I am glad to say that during the year 1905, all previous records in hatching and distributing fish were broken, there having been sent out from this hatchery no less than 5,217,020 fish of all kinds. Of these 3,295,500 were brook trout fingerlings No. 1, and 767,500 brook trout fingerlings No. 2, 1,077,500 lake trout fingerlings No. 2, and 68,000 Loch Leven trout fingerlings No. 2, 335 large male brook trout, 3,000 rock bass fingerlings No. 1, 2,150 black bass and the remainder miscellaneous fishes.

This gratifying total exceeds the previous eighteen months by 22,512 fish or at least 1,000,000 more than the previous calendar year.

I began shipping brook trout early in March and filled the last order the last week in May. During the month of March, I shipped 1,910,000 fingerlings, and in April 205,500, and in May 743,500.

For the first time in many years, owing to a long period of extremely dry weather, the water supply in the various springs on the hatchery appreciably diminished, and in No. 1 house reached danger point. This was in December, and I promptly augmented the supply from a pond which was supplied wholly with spring water. This water was much colder than that which regularly flowed into the house, and in consequence fry in the troughs supplied by it were much smaller than those in the water from the regular spring, but they were healthy, fine fish. This will account for the large number of fingerlings No. 1, which is reported. I am glad to say that by April 1st, the springs had resumed their normal flow and there has been no trouble since.

In three of the ponds were a large number of old males which were of no further use to the Department for breeding purposes, and on the direction of the Commissioner, they were sent to various ponds for public parks, etc., where they could be used for show purposes. By getting rid of these fish three of the ponds are now available for younger and good breeding trout.

The lake trout eggs received from the United States hatched well, although there was a slight percentage of loss among the advanced fry from "red throat," a disease which the young of this species of fish seem particularly liable, if overcrowded.

Inasmuch as the Department was disappointed last Autumn in obtaining lake trout eggs from Dunkirk on account of the fishermen not resetting their nets after a severe blow on the lake, it was thought best to make preparations at this and other hatcheries to become independent of wild fish for the supply of eggs. For this reason I have held back, at the request of the Commissioner, 75,000 best selected lake trout fingerlings to be retained for breeding purposes

in this and the Union City auxiliary. I propose, with the consent of the Commissioner, to retain several thousand annually. It requires four years for a lake trout to reach spawning age. With the stock held back this year, and that retained annually, in five years from now the Department should be certain of many million eggs of lake trout independent of those which may be taken from wild fish from Lake Erie and elsewhere.

Several years ago California trout were reared at this hatchery and many thousands sent out annually. The Fish Commissioner, however, decided to cease propagating the fish on the grounds that the results in the streams were not sufficiently satisfactory when the expense of rearing was considered. At the Allentown Station the number of barren males and females was nearly one half the total number. The proportion was not nearly so large at this hatchery, in fact it was scarcely more than the percentage of barrenness among the brook trout. Another reason the Fish Commission decided to abandon California trout culture was that at the Allentown hatchery the fish spawned in November at the same time as the brook trout. At the Corry hatchery the spawning season was the same as in their native waters on the Pacific coast, namely, March.

Two years ago I suggested to the Commissioner that it would be well to try the experiment work again of rearing California trout, at least at this hatchery. I drew his attention to the fact that the percent. of barrenness among the females was normal and the spawning season in March when the hatchery troughs were being emptied of brook trout, advanced fry and fingerlings. By taking up the California trout again the Department would thus be employing the hatching house for several months longer and would be able to plant that many more desirable fish. The area of the Corry hatchery has been extended and new ponds added, therefore the Department can afford to give some space to brood California trout.

The Commissioner received the suggestion favorably and a requisition made on the United States Government for eggs. Thirty thousand were received in the month of June from the United States station at Leadville, Colorado. They were in fine condition, and hatched with scarcely any loss. They are now in the ponds and doing well. With these fish alone two years hence I should be able to nearly double the present output of trout from this hatchery, without taking into consideration the vast increase which must come from the large number of brook trout which have been added to the breeding list. This addition is 100,000 young fish of wild trout received last May from the Wayne county hatchery.

The fish in the breeding ponds remained in splendid health during the year. There was at no time any indication of an epidemic, and the death rate was far below that which is usually considered normal. It was rare, in fact, to find a dead fish. I never saw finer, healthier, plumper trout. In fact, if there was anything wrong, they were a little too fat, because when we began to take eggs this fall I noticed that there were more "bloody eggs" than usual.

I began taking eggs on the sixth of October and the last were taken a few days before the close of the year. In all we took very nearly 5,000,000 eggs. I am sorry to say, however, that they were not as good on the average as in former years. At the outset there was a heavier percentage of loss than I like to see, and this loss I attribute to the prevalence of "bloody eggs" among the females.

Wherever we came upon a fish afflicted this way the eggs started hard at the vent and as they were expressed, clots of blood were mingled with them. I am inclined to think that this "bloody egg" trouble is due to their having been slightly over fed and allowed to become too fat. The egg loss, however, was only in the beginning. As soon as the first picking was over the death rate was normal only, and the total loss I think will not exceed twelve per cent. The eggs began to hatch on November 28th, and they are rapidly emerging from their shells fine and healthy fry. There should be at least 4,000,000 for distribution in the spring.

The rock bass and sunfish and yellow perch spawned freely in their respective ponds and the prospects were good for a large quantity of yellow perch. Unfortunately, the yellow perch had scarcely spawned when there came a period of extremely cold weather and a furious storm. The perch pond became thick with mud. The yolk sacs were cut and thousands upon thousands of the little creatures floated up against the outlet screen and died. Only a few hundred survived.

In the sunfish pond there gathered an immense quantity of algae, and it formed faster than it could be taken out, and also at a time when to do so would mean the taking out of the minute fish. We might, however, as well have done it first as at last for when we undertook to draw the pond for the purpose of getting out the sunfish and rock bass for distribution, the majority of them were smothered in the slime before they could be rescued.

Early in the fall I received a car load of large mouth bass from the United States Bureau of Fisheries. They were good sized specimens, but unfortunately were badly bruised. Fungus, consequently broke out among them and many died. It had been intended to keep them for breeding purposes at the New Crawford and Spruce Creek hatcheries, but the breaking out of the fungus compelled a change of plans and they were therefore distributed to applicants. This was decidedly the best plan because by putting them in the natural streams most of them would recover from the bruising more readily than they would in the ponds.

The latter part of November I received 5,500,000 lake trout eggs from the United States Fish hatchery at Northville, Michigan. A portion of these were intended for hatching in the Corry Station and the remainder at the new hatchery at Union City. When they arrived the Union City hatchery building was not quite ready, but a few days later was able to send over between 2,000,000 and 4,000,000. Considering the long journey and the fact that I was forced to crowd them in the troughs when they arrived, they have done very well.

Just before the winter closed the roof of the oldest portion of No. 1 hatching house gave way under the weight of the snow. Fortunately, at the time most of the troughs in that part of the house had been emptied of the fish and there was therefore no loss through the catastrophe.

It is not surprising the roof fell in since that portion of the house was built thirty years ago, and it is probable that there has never been more than twenty-four hours when the rafters have been free from moisture. Some one has said that trouble never comes singly

and this was true at the Corry hatchery last year. Within two weeks after the roof in No. 1 broke in, a part of the flooring of the hatchery No. 2 gave way fortunately without allowing any of the trfoughs to drop through. Hatchery No. 2 was a cheaply constructed affair, and it was built over the larger part of a trout pond; the floor joists were of wood and naturally rotted. Although built as recently as 1898, it is surprising that the floor joists held as long as they did. Indeed the floor was shaky for more than a year before any portion of it gave way.

As soon as the shipping season was over we began repairs. A new roof was put in No. 1 house in the early part of July, and the new floor on the No. 2 house the latter part of the same month. In order that there should not be as much dampness in the future, ventilators were put in the roof of No. 1 house and also No. 3 house. All the buildings were also painted white and green, the hatchery colors decided by the Commissioner. A flag pole was also planted on the hatchery ground, and on the Fourth of July, for the first time in the history of fish culture in Pennsylvania, the American flag floated over the grounds of the Corry hatchery, the flag having been sent from the Department at Harrisburg.

With the beginning of the summer commenced repair and extension work to the ponds. The fry ponds around No. 3 house were put perfect condition. Four new ponds at No. 3 were finished and three others started and completed just before frost, making seven new ponds added in 1905.

The work of building these ponds was extraordinarily difficult. They are located on the ground purchased two or three years ago from the Hatch estate. The whole place it dotted with springs and most of the ground is a muck heap. Just beneath the surface, water soaked trunks of trees buried, no man knows how many years ago, are to be found everywhere. In places the muck or quicksands are ten and fifteen feet deep. Last year when we began some ponds in this section we tried to build side walls of concrete but the effort was a failure owing to there being no good foundation; the walls cracked and sunk and bent out of shape. By patient tinkering at them I have at length succeeded in getting them to reach foundations, but they are by no means things of beauty.

With this experience in mind this year I made the side walls of boards, driving uprights down until they struck solid ground, then gouging out the ponds two feet deeper than I required them. On top of this muck I then spread thoroughly two feet of what we call here gravel, that is small stones from the size of a large marble to the size of a small orange. By spreading it on properly and then leaving it, in the course of a couple of weeks they seemed to bind up, indeed they formed a bottom on which a man could stand. Then adding some more gravel and letting it stand a couple of weeks I had a fairly firm bottom. The building of these seven ponds, which would ordinarily have been accomplished in about three weeks, took from the early part of July to the first of November.

Even after they were built I met with trouble from the innumerable little springs in the sponge ground on the right side; water squirted through the sides of the ponds in streams and broke above the surface of the ground. When on one of his tours of inspection I had a conference with Mr. Meehan on the subject of abat-

ing the trouble, the result of which was I built about six feet to the right of the present spring of the seven ponds three false ponds or wide ditches boarding the sides and ends of same as regular ponds, but made them only about two and a half feet deep. Into these false ponds the surplus water drains to a depth of about a foot and runs off into some of the lowest ponds. Later, if necessary, these false ponds may be utilized for holding No. 1 and 2 fingerlings kept for breeding purposes.

The superintendent's residence is an old structure, much older than the hatchery. It contains no modern conveniences and was badly in need of repair. The Board of Fishery Commission last winter decided to build a new dwelling and a contract was awarded during the summer to a local builder for a new house containing all the modern conveniences for the use of the superintendent. Owing to strikes and other troubles the house was not completed at the end of the calendar year. It is being built on the new grounds.

In addition to building new ponds, repairing the hatching house, keeping the lawn and walks in good condition on the old property, I began the work of putting the new grounds in presentable condition. I graded the ground along the dwelling house, marked out a driveway from the public road to No. 3 hatchery, planted maple trees on each side and cleared away most of the underbrush in the woods. If the Department could afford to give me two men I could keep them continuously for the next two years, in beautifying the new grounds and in keeping the old to the highest standard as it is this work may only be done at odd times.

My assistant in charge, William Haas, has been with the Department for more than fifteen years and to-day is as efficient a trout culturist as there is in the State. My first assistant, Jerre Burkhouse, has been in the employ of the Department for over eight years and is not far behind Mr. Haas in efficiency. Although I am exceedingly sorry to lose them, I feel that they both deserve the promotion to superintendencies, which have come to them and I venture to say that the new Spruce Creek Hatchery will, in the hands of Mr. Haas, become as important and successful as any in Pennsylvania, and that the Torresdale Hatchery, under the charge of Mr. Burkhouse, will come as rapidly to the front as a great station for river fishes. The list of distribution of fishes by counties is appended to this report.

The Following is the Estimated Number of Fish in the Breeding Ponds:

Brook trout four years old,	3,000
Brook trout three years old,	2,700
Brook trout two years old,	6,500
Brook trout one year old,	65,000
California fingerlings,	15,000
Gold fish,	350
Sunfish,	300
Rock bass,	200
Yellow perch,	600
Lake trout yearlings,	55,000

CORRY HATCHERY.

Output of Fish for Year 1905.

Brook Trout Fingerlings No. 1 Distributed from December 1, 1904,
to December 1, 1905.

Armstrong county,	1,500
Bradford county,	46,500
Cumberland county,	116,000
Cameron county,	15,000
Columbia county,	18,000
Carbon county,	40,000
Clinton county,	170,000
Cambria county,	19,500
Clarion county,	2,000
Crawford county,	21,000
Dauphin county,	81,000
Erie county,	54,500
Elk county,	76,500
Franklin county,	190,500
Fulton county,	28,000
Forest county,	52,000
Fayette county,	13,500
Indiana county,	4,500
Jefferson county,	62,000
Lycoming county,	214,500
Lackawanna county,	200,000
Lebanon county,	1,500
Luzerne county,	48,000
Mercer county,	58,500
McKean county,	307,000
Northumberland county,	6,000
Pike county,	24,000
Potter county,	404,000
Philadelphia county,	66,000
Somerset county,	66,000
Schuylkill county,	40,500
Susquehanna county,	8,000
Sullivan county,	113,500
Tioga county,	202,500
Venango county,	81,000
Wyoming county,	24,000
Wayne county,	24,000
Warren county,	253,000
Westmoreland county,	70,500
York county,	55,500
Callicoon, New York,*	4,000
Hancock, New York,*	4,000
Lordville, New York,*	8,000
	<hr/>
	3,295,500

*These fish were planted in Pennsylvania waters.

Brook Trout Fingerlings No. 2, Distributed from December 1, 1904,
to December 1, 1905.

Allegheny county,	51,500
Bradford county,	11,500
Berks county,	21,000
Cambria county,	19,500
Carbon county,	57,000
Clinton county,	16,500
Crawford county,	18,000
Columbia county,	4,500
Clarion county,	36,000
Dauphin county,	3,000
Elk county,	6,000
Erie county,	43,500
Fayette county,	15,000
Jefferson county,	9,000
Luzerne county,	53,500
Lackawanna county,	4,500
Lycoming county,	24,000
Lawrence county,	15,000
Monroe county,	13,500
McKean county,	64,500
Mercer county,	7,500
Mifflin county,	97,500
Northampton county,	67,500
Potter county,	6,000
Sullivan county,	15,000
Somerset county,	12,000
Schuylkill county,	3,000
Tioga county,	48,000
Venango county,	3,000
Warren county,	18,000
Wyoming county,	3,000
	<hr/>
Total,	767,000

Lake Trout Fingerling No. 2 Distributed from December 1, 1904, to
December 1, 1905.

Lackawanna county,	22,500
Luzerne county,	80,000
Sullivan county,	20,000
Wyoming county,	50,000
Wayne county fish hatchery,	5,000
Planted in Lake Erie,	900,000
	<hr/>
Total,	1,077,500

Loch Levan Trout Fingerlings No. 2, Distributed from December 1,
1904, to December 1, 1905.

Chester county,	34,000
Philadelphia county,	34,000
	<hr/>
Total,	68,000

Large Male Brook Trout, Males Distributed from December 1, 1904,
to December 1, 1905.

Bucks county,	25
Centre county,	50
Lackawanna county,	25
Lancaster county,	100
Philadelphia county,	65
York county,	70
Total,	335

Yellow perch fingerlings No. 2, sent to Torresdale hatchery from December 1, 1904, to December 1, 1905,	100
Rock bass fingerlings No. 1 sent to Torresdale hatchery from December 1, 1904, to December 1, 1905, ..	3,000
Blue gill sun fish fingerlings No. 1 sent to Torresdale hatchery from December 1, 1904, to December 1, 1905,	600
Gold fish 1 year old sent to Torresdale hatchery,	300
Yearling gold fish distributed from December 1, 1904, to December 1, 1905, Allegheny county,	30

Yearling Black Bass Distributed from December 1, 1904, to December 1, 1905.

Armstrong county,	50
Crawford county,	100
Carbon county,	50
Forest county,	50
Lackawanna county,	200
Lancaster county,	100
Lycoming county,	100
Lebanon county,	50
Montgomery county,	50
Mercer county,	100
Northampton county,	50
Northumberland county,	50
Philadelphia county,	50
Susquehanna county,	250
Venango county,	200
Wayne county,	650
Warren county,	50
Total,	2,150

Large Black Bass Distributed from December 1, 1904, to December 1, 1905.

Wayne county,	100
---------------------	-----

WM. BULLER,
Superintendent Corry Hatchery.

ERIE HATCHERY, STATION No. 2.

Report of A. G. Buller, Superintendent.

To the Members of the Fish Commission:

Gentlemen: I submit to you my annual report from December 1, 1904, to December 1, 1905. There was a larger amount of white fish and lake herring eggs received this season than in previous years, in fact the supply was so large that we were not able to care for the full number, although if we had had a sufficient number of jars to fill the batteries, we would have been able to retain the greater portion. I might add we have since received the number of jars necessary to fill the batteries. I was directed by Mr. Meehan to ship the surplus eggs to the Torresdale hatchery. The number of eggs shipped were 3,096,000 white fish and 15,760,000 lake herring eggs.

The eggs taken from the Port Clinton spawning grounds proved to be of a better quality than those received from other points. The fish began to hatch the 26th day of February, which was unusually early. The average temperature of the water during the month of February was five degrees warmer than the month of January, which accounts for the early hatching. The last fry were planted on March 30th. The total amount of white fish and lake herring eggs hatched was 57,329,000.

The first shipment of wall-eyed pike eggs was received on April 10th. We continued to receive eggs until the 22nd of the month. The total amount received was 63,350,000. On May 1st the fish began hatching and the total amount was 51,300,000. Five million eight hundred and thirty-six thousand of this number were distributed to different parts of the State. The remainder were planted in Lake Erie.

The next eggs received in the hatchery were of the blue pike. The number was 24,500,000. Of this number there were 9,450,000 hatched and planted in Lake Erie.

I regret to report the poor condition of these eggs. In the first place we have to depend entirely on the fishermen to collect them. Each boat fishing had from three to four gangs of nets in the lake at one time and they often remained in the water for probably several days before they were lifted. Naturally the larger number of the fish had been dead for some time. The condition of the water, also the weather at this time of the year, is very unfavorable, consequently, there is usually a large loss in the hatching of the blue pike.

The next important feature at the hatchery was the hatching of the frogs. The demand for frogs last year was exceedingly large, and we were quite successful in hatching a large amount, considering the limited amount of room we had to carry on the work. We were highly encouraged and anticipate much better success this season. I utilized two ponds for the frog spawn which was gathered in large quantities, the total number being 120,000. Through inex-

perience, frog culture yet being in an experimental state, the ponds were over stocked. The tad-poles began dying rapidly when they were about six weeks old, but we did not realize the cause until it was too late. When we finally noticed their alarming condition, we removed the remaining tad-poles to the number of 30,000 to the ponds on the peninsula. I feel that our past experience has given us sufficient reason to believe that our next attempt will be more successful.

On November 14, 1905, we received the first shipment of white fish spawn. The eggs came in quite rapidly. On the 27th day, we received our last shipment, making a total of 41,976,000. We are better prepared for handling a larger number of eggs this season than in previous years.

As the amount of white fish eggs received was not sufficient to fill the batteries, I asked Mr. Meehan's permission to employ a number of the fishing tugs from Erie in order to collect lake herring spawn. Under the new law the fishing season closes November 15. Mr. Meehan decided to employ the fishing tugs to collect spawn for the hatchery. The first boats began fishing on November 23. As the nets had been removed from the lake, there was some difficulty in locating the fish. From the time they began fishing until December 1st, they collected 6,880,000 eggs. If the weather continues favorable we should be able to fill the house.

I wish to speak here of the jar Mr. Meehan has invented. Mr. Meehan had two sample jars forwarded to this hatchery and asked me to give them a thorough test. We have the jars in constant use and compared them carefully with the MacDonald jar, the only other type in use in this hatchery. Up to the present time the jar has given perfect satisfaction. The shape of the inside and bottom is similar to the MacDonald jar, but the top differs materially as it has an opening similar to the Downing which affords better access to the eggs. Another decided improvement is the flat bottom stand. The MacDonald jar has small feet or knobs on the bottom which are very easily broken when the jar is practically of no further use. The jar as it now is, works four quarts and one pint of eggs with one and one half quarts of water to the minute. I suggested to Mr. Meehan to raise the spout or lip one inch higher. By so doing the jar will conveniently carry a larger number of eggs.

Mr. Meehan directed me to collect the licenses for fish in Lake Erie for 1905. There were 101 licenses issued. There were \$71.00 collected for trap nets, \$40.00 for night lines, \$980.00 for gill nets, \$5.00 for dip net, \$440.00 for pound nets, making a total of \$1,536.00.

I wish to speak of my assistant, Philip H. Hartman. I feel that a great deal of credit is due Mr. Hartman. He took particular pains in the work after my leaving on the 4th day of September for Union City to take charge of the auxiliary hatchery.

The number of visitors registered this year was 2,151.

There were several changes made at the hatchery. The porch on the south side of the building was enclosed, which has enlarged the working space inside. As we did not have sufficient light in the hatchery, Mr. Meehan directed me to have a window put in on the west side of the building. There were some needed repairs made on one of the batteries. There was also an old fry tank removed and a new one put in its place. The building was given a coat of paint

both inside and outside. The fence was repaired and also painted. A flag pole was raised and from its top floated the stars and stripes.

Yours respectfully,

A. G. BULLER,
Superintendent.

ERIE HATCHERY.

Output of Fish for Year 1905.

Wall-eyed Pike Fry Distributed from December 1, 1904, to December 1, 1905.

May 5, Armstrong county,	80,000	
May 10, Bradford county,	120,000	
May 9, Clearfield county,	96,000	
May 4, Crawford county,	230,000	
May 8, Cumberland county,	72,000	
May 8, Dauphin county,	96,000	
May 8, Forest county,	200,000	
May 8, Huntingdon county,	120,000	
May 10, Luzerne county,	36,000	
May 10, Lackawanna county,	48,000	
May 9, Lycoming county,	288,000	
May 4, Lawrence county,	90,000	
May 4, Mercer county,	570,000	
May 5, Mercer county,	300,000	
		870,000
May 8, Northumberland county, ...	60,000	
May 9, Northumberland county, ...	120,000	
		180,000
May 8, Perry county,	80,000	
May 8, Snyder county,	120,000	
May 10, Susquehanna county,	354,000	
May 5, Venango county,	1,250,000	
May 8, Venango county,	290,000	
		1,540,000
May 8, Warren county,	640,000	
May 12, Warren county,	480,000	
		1,120,000
May 8, York county,	120,000	
May 4 to 12, Planted in Lake Erie,	45,464,000	
Total,		51,324,000

ERIE HATCHERY.

Yellow Perch Eggs sent to Corry, Wayne County and Bellefonte Hatcheries from December 1, 1904, to December 1, 1905.

May 18, Wayne County Hatchery,	180,000
May 21, Bellefonte Hatchery,	100,000
May 26, Corry Hatchery,	100,000
Total,	380,000

Yellow Perch Fry sent to Corry and Bellefonte Hatcheries from December 1, 1904, to December 1, 1905.

May 21, Bellefonte Hatchery,	20,000
May 26, Corry Hatchery,	50,000
Total,	70,000

ERIE HATCHERY.

Fish Caught for Corry and Wayne County Hatcheries from December 1, 1904, to December 1, 1905.

Adult yellow perch,	815
Yellow perch fingerlings No. 3,	600
Rock bass, adult,	265
Calico bass, adult,	107
Sun fish, adult,	543
Black bass, adult,	285
Grass pike, adult,	182
Black bass fingerling No. 4,	47
Total,	2,844

ERIE HATCHERY.

Black Bass Distributed from December 1, 1904, to December 1, 1905.
Fingerlings No. 2.

August 17, Blair county,	800
September 1, Columbia county,	200
August 7, Huntingdon county,	800
September 1, Lebanon county,	200
September 1, Lycoming county,	200
September 22, Susquehanna county,	300
Total,	2,500

Black Bass Fingerlings No. 3.

August 7, Huntingdon county,	2,000
------------------------------------	-------

Black Bass Fingerlings No. 4.

September 22, Susquehanna county,	100
---	-----

ERIE HATCHERY.

Black Bass Distributed from December 1, 1904, to December 1, 1905.
Fingerlings No. 4.

November 7, Chester county,	90
November 7, Lebanon county,	30
November 7, Philadelphia county,	60
Total,	180

Cat Fish, Fingerlings No. 1.

July 22, Elk county,	2,000
----------------------------	-------

ERIE HATCHERY.

Yellow Perch Distributed from December 1, 1904, to December 1, 1905.

Fingerlings No. 3.

September 22, Carbon county,	2,000
September 22, Columbia county,	1,250
September 22, Lackawanna county,	1,000
Total,	4,250

ERIE HATCHERY.

White fish fry planted in Lake Erie from December 1, 1904, to December 1, 1905,	34,489,000
Lake herring fry planted in Lake Erie from December 1, 1904, to December 1, 1905,	22,840,000
Wall-eyed pike fry planted in Lake Erie from December 1, 1904, to December 1, 1905,	45,464,000
Blue pike fry planted in Lake Erie from December 1, 1904, to December 1, 1905,	9,450,000
Tadpoles planted in ponds on peninsula at Erie from December 1, 1904, to December 1, 1905,	30,000

ERIE HATCHERY.

White Fish Eggs Sent to Torresdale Fish Hatchery from December 1, 1904, to December 1, 1905.

December, 1904, White fish eggs, 3,096,000

Lake Herring Sent to Torresdale Fish Hatchery from December 1, 1904, to December 1, 1905.

December, 1904, Lake Herring eggs,..... 15,760,000

ERIE HATCHERY.

Licenses Collected at Erie from December 1, 1904, to December 1, 1905.

1905.			
March 28,	M. L. Alford, Northville, Pa., 3 trap nets,	\$3 00	
28,	W. M. Truesdall, Northville, Pa., 3 trap nets,	3 00	
April 4,	W. E. Babcock, Northville, Pa., 5 trap nets,	5 00	
5,	F. Helmbrecht, N. Springfield, 2 trap nets,	2 00	
6,	Keystone Fish Co., Erie, Pa.: Tug W. J. McCarter, gill nets,	15 00	
	Tug Rainbow, gill nets,	15 00	
	Tug E. C. Oggell, gill nets,	20 00	
	Tug Doctor, gill nets,	20 00	
12,	H. N. Joles, North Girard, 10 trap nets,	10 00	
12,	Andrew Joles, North Girard, 10 trap nets,	10 00	
14,	Clark Service, North Springfield, 2 trap nets,	10 00	
15,	R. Kunth, North Springfield, 2 trap nets,	2 00	
19,	Case, Johnson & Co., North Girard, 4 trap nets,	4 00	
19,	Case, Johnson & Co., North Girard, 1 sail boat gill net,	5 00	
19,	Gilson Johnson, Fairview, Pa., 6 pound nets,	60 00	
24,	Henry Burg, Erie, Pa.: Tug Master Esser, gill nets,	20 00	
24,	Ed. Lamp, Erie, Pa.: Ping Pong gas boat, gill nets,	5 00	
24,	Geo. Nunne, Erie, Pa.: Sail boat, gill net,	5 00	
24,	Charles Nelson, Erie, Pa.: Sail gas boat, gill nets,	5 00	
24,	Frank Wiegand, Erie, Pa.: Sail gas boat, gill nets,	5 00	
24,	Joe Degnan, Erie, Pa.: Sail gas boat, gill nets,	5 00	
26,	Theodore Wagner, North East, 2 trap nets,	2 00	
28,	Eugene Loesch, Erie, Pa.: Tug Eugene Loesch, gill nets,	15 00	
28,	Tug Kate Wilson, gill nets,	15 00	
28,	J. J. Fickles, Harbor Creek: Sail boat, gill nets,	5 00	
29,	Schlafferle Bros., North East, 4 pound nets,	40 00	
May 1,	R. Kunth, North Springfield, 1 trap net,	1 00	
18,	Doke Reed, Erie: Wm. Truesdall, Northville, 5 trap nets,	5 00	
1,	Jerry Driscoll, Erie: Tug Norma,	15 00	
1,	Wm. Daggett, North Girard, 1 pound net,	10 00	
1,	Keystone Fish Co., Erie: Tug Erie, gill net,	20 00	
	Tug H. H. Boyd, gill net,	20 00	
	Tug C. W. Desmond, gill net,	20 00	
	Tug Eagle, gill net,	15 00	
1,	Joe Fratus, Erie: Steam launch, gill nets,	10 00	
1,	M. Maher, Erie, Pa.: Tug Hingston, gill nets,	20 00	
2,	Frieburg & Co., Erie, Pa.: Gas sail boat,	5 50	
4,	H. J. Knight, Manager, A. Booth & Co., Erie: Tug Vallant, gill nets,	20 00	

LICENSES COLLECTED—Continued.

1905.			
May 4,	Tug Cockerell, gill nets,	20 00	
5,	Tug Comet, gill nets,	15 00	
8,	W. E. Babcock, Northville, 1 trap net,	1 00	
8,	C. W. Ziegler, Erie: Sail boat, gill nets,	5 00	
8,	Frank Nunne, sail boat, gill nets,	5 00	
8,	Dash & Masters, Erie: Five pound nets,	50 00	
11,	W. F. Pinney, Erie: Sail boat, gill nets,	5 50	
11,	F. P. Eichbacher, Erie: Tug Harold J., gill nets,	20 00	
12,	Richter, Wagner & Smith, Erie, 1 dip net,	5 00	
15,	Chris Schan, Erie: Tug Silver Spray, gill nets,	20 00	
15,	William Wilson, Erie: Tug Planet, gill nets,	20 00	
15,	Keystone Fish Co., Erie: Tug Don, gill nets,	15 00	
15,	Dan Elliott, Erie: Tug Elma, gill nets,	20 00	
15,	C. Hudson, Erie: Tug Jean, gill nets,	15 00	
15,	Kraus Co., Erie: sail boat, gill nets,	5 00	
15,	Dash & Masters, Erie, 5 pound nets,	50 00	
16,	Joe Bowman & Co., Swanville, 6 pound nets,	60 00	
18,	Doke Reed, Erie: Row boat, gill nets,	5 50	
18,	Reed & Duwallie, Erie, 4 pound nets,	40 00	
18,	Gronnette & Spaulding, Erie: Row boat, gill nets,	5 50	
18,	Jake Frantz, Erie: Row boat, gill nets,	5 50	
19,	6 trap nets,	5 50	
19,	Straub & Furhman, Erie, 3 pound nets,	30 00	
19,	Ed McIntire, North Springfield 2 trap nets,	2 00	
20,	Swanville Fish Co., Swanville, 5 pound nets,	50 00	
26,	M. Weindorf, Erie, 7 trap nets,	7 00	
June 1,	Dash & Masters, Erie, 4 pound nets,	40 00	
1,	Keystone Fish Co., Erie: Tug Uncle,	15 00	
5,	Gilson Johnson, Fairview, 1 pound net,	10 00	
8,	Joe Fratus, Erie, 1 trap net,	1 00	
12,	H. W. Joles, North Springfield, 4 trap nets,	4 00	
26,	Freberg & Peterson, Erie: Sail boat, gill nets,	5 50	
Aug. 1,	Penna. Fishing Co., Pittsburg, Pa.: Tug Robert E. Goodill, gill nets,	15 00	
	Tug Hugh Stocker, gill nets,	20 00	
	Tug J. L. Wyland, gill nets,	20 00	
	Tug James Burns, gill nets,	20 00	
	Tug Wm. H., gill nets,	20 00	
	Tug Buckeye, gill nets,	20 00	
1,	Richard P. Dalley, Erie, Pa.: Tug Kate White, gill nets,	20 00	
5,	Schlafferle Bros. Northeast, one night line,	5 00	
10,	Lamar Gibson, Northeast, one night line,	5 00	
11,	H. L. Moore, Erie: Tug Gull, gill nets,	20 00	
	Tug Rowira, gill nets,	20 00	
	Tug Helene, gill nets,	20 00	
11,	James Kelley Estafe, Erie: Tug H. G. Barnhurst, gill nets,	20 00	
14,	Wm. Friesdall, Northville, Pa., one night line,	5 00	
15,	Wm. D. Lowes, Northeast, one night line,	5 00	
15,	W. E. Babcock, Northeast, one night line,	5 00	
15,	Henry F. Schan, Erie: Tug Frank and Jim,	20 00	
19,	Gilson Johnson, Avonia, one night line,	5 00	
21,	J. C. Elviage, Erie: Gas boat Ida, gill nets,	10 00	
24,	M. L. Alford, Northeast, one night line,	5 00	
24,	J. C. Elviage, Erie: Tug Puritan, gill nets,	20 00	
Sept. 1,	Eugene Loesch, Erie: Tug Arita, gill nets,	15 00	
1,	E. D. Carter, Erie: Tug C. H. Lamb, gill nets,	20 00	
1,	E. H. Thompson, Erie: Tug H. G. Brooks, gill nets,	20 00	
1,	C. W. Pruyn, Erie: Sail boat, gill nets,	5 00	
16,	Miller & Herbig, Erie: Sail boat, gill nets,	5 00	
18,	Richard Kunth, North Springfield, 1 trap net,	1 00	
19,	H. J. Knight, Manager A. Booth & Co.: Tug Duchess, gill nets,	20 00	
	Tug Lovisa, gill nets,	15 00	
	Tug Susie B., gill nets,	15 00	

LICENSES COLLECTED—Continued.

1905.			
Sept.	19,	R. P. Dalley, Erie:	
		Tug Phil G. Schaffer, gill nets,	20 06
	19,	Penna. Fishing Co., Pittsburg:	
		Tug Osceola, gill nets,	20 00
	20,	H. J. Knight, Manager, Erie:	
		Gas boat, gill nets,	10 00
Oct.	1,	Thos. J. Welsh, Erie:	
		Tug Mary & Norma, gill nets,	15 00
	1,	J. J. Fickers, Harbor Creek one night line,	5 00
Nov.	7,	Wm. Tallman, Erie:	
		Tug Rocket,	20 00

BELLEFONTE HATCHERY, STATION No. 3.

Report of Superintendent Howard M. Buller.

Hon. W. E. Meehan, Commissioner of Fisheries:

Dear Sir: I have the honor of submitting my second annual report of the operations conducted under my charge at the Bellefonte hatchery. An exceedingly large amount of work was accomplished, both in rearing fish, and gathering eggs and also in extending the plant. In respect to the latter, a person who might have visited the hatchery a year ago, and then not seen it until the close of the present year would scarcely recognize the place. The few temporary ponds which existed in 1904 have been made permanent and several large groups of new ponds have been constructed. All the buildings have been painted a uniform white and green, to conform to the color of the buildings at other hatcheries in the State. A flag floats from a large staff on the property and the grounds around most of the ponds have been graded and sodded or sown with grass seed. More than sixteen acres have been added to the establishment, making it the largest hatchery property in the State. Most of these improvements and extensions are due directly to the interest which Mr. Meehan has shown in the development of the hatchery, and under his direct supervision.

At the close of the calendar year, there were more trout eggs in the hatching house than at any time since the establishment of the station, and for the first time the take of eggs from the fish in the breeding ponds, exceeded one million. At the close of the year there were in the hatching troughs 3,230,500 brook trout eggs either hatched or hatching. Of this number 2,190,500 were received from the Penn Forest Brook Trout Company and 1,040,000 were from fish in our own breeding ponds.

In addition to the above there were 150,000 California trout eggs from fish in our own breeding ponds in the troughs, making a total of 3,380,500 trout eggs of all species. The 150,000 California trout eggs now taken represent rather less than one-half the eggs of that species which will be taken before all the fish are stripped.

We began taking brook trout eggs at Bellefonte from our own fish on November 19, two days later than the previous year. For awhile the eggs came unusually fast and within a week the troughs began to exhibit a very satisfactory appearance. From the 19th we took eggs daily until about the middle of December when the supply began rapidly to diminish and sometimes two days would elapse without our finding any ripe fish. The last eggs were taken on December 28.

Early in October, Mr. Meehan notified me that the Penn Forest Brook Trout Company near Mauch Chunk had generously donated all its surplus trout eggs to the State, and that the take was assigned



Bellefonte Hatchery. Outside Nursery Troughs.

BELLEFONTE HATCHERY, STATION No. 3.

Report of Superintendent Howard M. Buller.

Hon. W. E. Meehan, Commissioner of Fisheries:

Dear Sir: I have the honor of submitting my second annual report of the operations conducted under my charge at the Bellefonte hatchery. An exceedingly large amount of work was accomplished, both in rearing fish, and gathering eggs and also in extending the plant. In respect to the latter, a person who might have visited the hatchery a year ago, and then not seen it until the close of the present year would scarcely recognize the place. The few temporary ponds which existed in 1904 have been made permanent and several large groups of new ponds have been constructed. All the buildings have been painted a uniform white and green, to conform to the color of the buildings at other hatcheries in the State. A flag floats from a large staff on the property and the grounds around most of the ponds have been graded and sodded or sown with grass seed. More than sixteen acres have been added to the establishment, making it the largest hatchery property in the State. Most of these improvements and extensions are due directly to the interest which Mr. Meehan has shown in the development of the hatchery, and under his direct supervision.

At the close of the calendar year, there were more trout eggs in the hatching house than at any time since the establishment of the station, and for the first time the take of eggs from the fish in the breeding ponds, exceeded one million. At the close of the year there were in the hatching troughs 3,230,500 brook trout eggs either hatched or hatching. Of this number 2,190,500 were received from the Penn Forest Brook Trout Company and 1,040,000 were from fish in our own breeding ponds.

In addition to the above there were 150,000 California trout eggs from fish in our own breeding ponds in the troughs, making a total of 3,380,500 trout eggs of all species. The 150,000 California trout eggs now taken represent rather less than one-half the eggs of that species which will be taken before all the fish are stripped.

We began taking brook trout eggs at Bellefonte from our own fish on November 19, two days later than the previous year. For awhile the eggs came unusually fast and within a week the troughs began to exhibit a very satisfactory appearance. From the 19th we took eggs daily until about the middle of December when the supply began rapidly to diminish and sometimes two days would elapse without our finding any ripe fish. The last eggs were taken on December 28.

Early in October, Mr. Meehan notified me that the Penn Forest Brook Trout Company near Mauch Chunk had generously donated all its surplus trout eggs to the State, and that the take was assigned



Bellefonte Hatchery. Outside Nursery Troughs.

by him to the Bellefonte hatchery, until the hatching house should be filled to its full capacity. He also stated that under the arrangements made with the officers of the Penn Forest Brook Trout Company, our men were to take all the eggs, beginning to ship to Bellefonte as soon as it plainly evident that there would be eggs enough to fill the house at Penn Forest. He directed me to detail the requisite number of spawn takers and messengers and to send them over as rapidly as they were required.

Acting under these orders, I sent one of my first assistants, Mr. B. O. Webster over to Penn Forest about November first, directing him to get everything in readiness at that hatchery to take the eggs as soon as the fish should ripen. Mr. Webster began taking eggs about November 9th, and on November 14th he made the first shipment, Fourth Assistant Houser acting as messenger and helper. The entire force of employes at Penn Forest were placed at the disposal of Mr. Webster, yet a few days later, I had to send another first assistant, Mr. E. F. Tinker, to help, because the eggs had begun to come with great rapidity. Mr. Webster's first shipment was 923,000. As at Bellefonte, the eggs when they did begin to ripen came with great rapidity for some time. By December 2d, the greater number had been taken and Mr. Webster was ordered back to the hatchery, leaving Mr. Tinker at Penn Forest. In all the two assistants gathered 2,190,500 eggs while at Penn Forest, considerably less than was gathered at the same place last year. The last shipment of eggs amounted to 26,000.

From the very beginning the eggs did well, even the green eggs from Penn Forest carried well and gave but a slight percentage of loss. In consequence, at the close of the year from all appearances we will hatch between 85 and 90 per cent. of all the eggs. Our eggs began to eye in 20 days with a water temperature which is uniformly at 50 degrees Fahrenheit, and the fish began emerging from the eggs in 40 days.

The California trout from which we are now gathering eggs, were sent to this hatchery as fingerlings in the fall of 1903 by the United States Bureau of Fisheries. They are now three years old, and this is therefore the first year of their spawning. A number of years ago, the Pennsylvania Fish Commission undertook the propagation of California trout at its Allentown and Corry hatcheries, and a number of peculiarities developed which caused the Commission to cease raising the fish. Among them was the peculiar fact that fully fifty per cent. of the females were annually barren, and fully fifty per cent. of the males were either barren or yielded "cheesy" milt.

When we began the examination of the fish at the Bellefonte station, we found to our surprise the same peculiarity of barrenness, only not to the same extent as at Allentown, and that it was confined entirely to the females. The percentage of barrenness among the females was about 33 per cent. I think I never saw finer males, or males in better condition as regards perfect and abundant milt. The eggs of the females were also of splendid form and condition.

In the old days at Allentown the California trout began spawning about the same time as the brook trout, but in Corry in March. Here at Bellefonte the fish ripened the last of December. A peculiar feature about this difference in time of hatching is that the water at Allentown was 52, that at Corry 46 while that at Bellefonte is



Bellefonte Hatchery. Nest of Concrete Side Ponds.

50. This indicates that the temperature of the water has little or nothing to do with the period of ripening, as it was thought was the case when there were only the Allentown and Corry fish.

The brook trout were in very fine condition this year at the spawning season, far superior to the fish the same time the previous year. Very few fish were lost through handling during the spawning period, and there was almost a total absence of fungus. Out of the entire stock we lost less than fifty and there were only two fish which showed "bloody egg." Both of these were from among the two year old fish.

The newly hatched fry are very strong and appear to be imperfect health. Among the fry are 25,000 wild trout, from eggs of fish which found their way into the hatchery grounds from Logan Branch creek which flows through the place.

I regret to say that for several months beginning with last spring I had a heavy mortality among the fingerling trout reserved for breeding purposes, hence this autumn I only had a little over ten thousand yearlings to add to my stock of breeders. The mortality was caused through their being kept too long in ponds the sides and bottoms of which were of concrete.

We began shipping trout last spring to applicants on March 13th, and by continuous and persistent work we filled the last application on May 4th. In all, we filled 1,114 applications with a total of 1,704,000 fingerling trout. The fish were sent into 24 counties, Centre county, naturally, being the home of the hatchery receiving the largest lot, 382,500. Excepting where otherwise ordered by the Commissioner I sent 1,500 fish to an application.

We have one pond devoted to gold fish, there are less than one hundred, but they are all fancy Jananese and these began spawning about the last of July or beginning of August. About five hundred were hatched and when they were of proper size, some were sent to schools in Watsontown, some to the Torresdale hatchery and about 200 retained in this hatchery for future breeding purposes.

During the early spring, acting under instructions from the Commissioner, I had one of the gold fish ponds, unoccupied, arranged for the rearing of frogs. A wire fence with very small meshes was built around the pond about three feet from the edge, and a strip of muslin fastened around the top to prevent frogs from escaping.

About three dozen frogs were caught and placed in the pond when it was finished. There were three species, the leopard, green and common or large frog. The first two had certainly spawned before being placed in the ponds, and I do not think spawned afterwards, but am not positive on this point. Certain among the three species however did spawn, but whether it was the common frog or a second spawning of the leopard and green I cannot tell. Which ever it was, the tadpoles which were hatched were not transformed into frogs by the time winter had set in. With the appearance of hard frost both the adult frogs and the tadpoles disappeared into the mud at the bottom of the pond, and with them nearly a hundred small frogs which had been developed from tadpoles hatched from spawn deposited early in the spring. Both the frogs and tadpoles are all



Bellefonte Hatchery. Nest of Concrete Side Ponds.

50. This indicates that the temperature of the water has little or nothing to do with the period of ripening, as it was thought was the case when there were only the Allentown and Corry fish.

The brook trout were in very fine condition this year at the spawning season, far superior to the fish the same time the previous year. Very few fish were lost through handling during the spawning period, and there was almost a total absence of fungus. Out of the entire stock we lost less than fifty and there were only two fish which showed "bloody egg." Both of these were from among the two year old fish.

The newly hatched fry are very strong and appear to be imperfect health. Among the fry are 25,000 wild trout, from eggs of fish which found their way into the hatchery grounds from Logan Branch creek which flows through the place.

I regret to say that for several months beginning with last spring I had a heavy mortality among the fingerling trout reserved for breeding purposes, hence this autumn I only had a little over ten thousand yearlings to add to my stock of breeders. The mortality was caused through their being kept too long in ponds the sides and bottoms of which were of concrete.

We began shipping trout last spring to applicants on March 13th, and by continuous and persistent work we filled the last application on May 4th. In all, we filled 1,114 applications with a total of 1,704,000 fingerling trout. The fish were sent into 24 counties, Centre county, naturally, being the home of the hatchery receiving the largest lot, 382,500. Excepting where otherwise ordered by the Commissioner I sent 1,500 fish to an application.

We have one pond devoted to gold fish, there are less than one hundred, but they are all fancy Jananese and these began spawning about the last of July or beginning of August. About five hundred were hatched and when they were of proper size, some were sent to schools in Watsontown, some to the Torresdale hatchery and about 200 retained in this hatchery for future breeding purposes.

During the early spring, acting under instructions from the Commissioner, I had one of the gold fish ponds, unoccupied, arranged for the rearing of frogs. A wire fence with very small meshes was built around the pond about three feet from the edge, and a strip of muslin fastened around the top to prevent frogs from escaping.

About three dozen frogs were caught and placed in the pond when it was finished. There were three species, the leopard, green and common or large frog. The first two had certainly spawned before being placed in the ponds, and I do not think spawned afterwards, but am not positive on this point. Certain among the three species however did spawn, but whether it was the common frog or a second spawning of the leopard and green I cannot tell. Which ever it was, the tadpoles which were hatched were not transformed into frogs by the time winter had set in. With the appearance of hard frost both the adult frogs and the tadpoles disappeared into the mud at the bottom of the pond, and with them nearly a hundred small frogs which had been developed from tadpoles hatched from spawn deposited early in the spring. Both the frogs and tadpoles are all

as far as I know in a perfectly healthy condition. I had evidence of the truth of this a few weeks ago. I had occasion to make some slight repairs to the outlet of the pond, and in doing so, turned up some of the mud at the bottom of the pond, and by so doing disturbed several frogs and tadpoles. They were all fat and in fine condition.

When the frogs spawned last summer and after the tadpoles were hatched I was directed to keep a close watch on the mature frogs to ascertain whether they ate tadpoles. I was unable to catch any frogs in the act of devouring tadpoles, but I am convinced that they do, for although I found no dead tadpoles from the time of their hatching until the setting in of winter, there was a large decrease in the number of tadpoles, without there having been any possibility of their escaping from the pond. Few if any were eaten by birds or animals, and no snakes were found at any time in the pond. Hence I conclude that those which disappeared were in most instances at least eaten by the parent frogs.

Expecting a very large supply of trout eggs for hatching this winter I built two more hatching troughs in the hatching house, occupying the space which had formerly been used for the meat chopping machine, afterwards transferred to the new meat house, making in all 82 troughs in the house and increasing the capacity by 200,000 eggs and at least 50,000 advanced fry. As this was not deemed sufficient I built 68 outside troughs twenty feet west of the hatching house. These I built in two tiers of 34 each, so that the same amount of water could be used twice over. Each trough is 16 feet long by 23 inches wide and ten inches deep. Along the upper end of the first or upper tier is a supply trough 100 feet long, 14 inches wide and 12 inches deep, the water supply coming through a six inch terra cotta pipe which taps the end of the supply sluice of the group of 13 concrete ponds 200 feet above.

After the water has passed through the 34 upper troughs it flows into a supply trough the same size of the one just mentioned which extends along the upper end of the second tier, and when the water has been utilized in the lower troughs, it flows into a pond which I am constructing between the troughs and the hatching house. The pond will be 100 feet long and twenty feet wide and is designed to hold water varying from one to two feet deep, and in this pond can be retained at least 2,000,000 fingerlings which have just passed the advanced fry stage. By these additions the capacity of the Bellefonte hatchery for trout has been increased by many million, and it will be several years before additional arrangements will have to be made. In order to provide for an overflow which is sure to occur, there has been added two overflow troughs 12 inches wide and 10 inches wide and 10 inches deep. The entire work has been done in a substantial manner. The troughs are set on a concrete foundation and supported at intervals by concrete pillars.

As it was known by me last spring that these troughs were to be constructed, it became necessary to provide additional pond room for breeding fish, and by August 1st, I had completed five, and at the same time 13 more were built under a contract awarded by the Commissioner. Other ponds were built by Mr. Safford, while I was ill, so that by the close of the calendar year there were 35 ponds capable of carrying yearling and older trout to the number of many

thousand. In addition there are 11 nursery ponds attached to the east side of the building in which in an emergency large trout can be carried for an indefinite period. There are therefore in all 46 ponds of various sizes. At the present time there are in the ponds yearling 10,000, 2 and 3 year olds about 11,000, making in all 21,000 fish which will yield eggs next year.

For three years I have been suffering from some internal complaint which baffled the skill of physicians. Late last spring the disease whatever it was, assumed a very severe form, and on August 1st, the Commissioner relieved me temporarily of my superintendency in order that I might undergo treatment. Mr. W. H. Safford, a first assistant, was placed in charge, and it was not until October 1st that I had recovered sufficiently to resume my duties as superintendent. I wish at this point to express my sense of deep obligations to Mr. Meehan, the Commissioner of Fisheries, for his very considerate treatment of me during the period of my severe illness. Through his goodness, at a time when I was unable to give proper attention to the work of the hatchery, I was relieved from my duties was enabled to give my whole time to recovery. Mr. Safford's report which is appended covers the work at the hatchery during the period of my illness.

One day during the summer, while train hands were running a car load of cement into our car barn, they lost control of the car with the result that it crashed through the end of the building knocking the whole of it out. The company promptly sent a gang of workmen and repaired the structure. Subsequently Mr. Meehan notified the company that they could lay an additional siding from the far end, which would prevent a recurrence of the accident, but although the action of Mr. Meehan was taken at the suggestion of the company the siding was not put in. This ought certainly to be done as soon as possible, not only that accidents such as I have described cannot occur again, but also in order that the fish car can be more easily taken out and returned to the barn.

The fish car is in good condition. At the present time there is nothing which needs be done to it. Any trifling breaks which have occurred during the year were promptly fixed on general instructions given the railroad men by the Commissioner.

There is one improvement in the car which I would like to respectfully suggest, namely that upper berths be placed in the sleeping compartment. At present there are only two lower berths each capable of holding only one man. It frequently happens on a short or medium trip early in the spring or late in the fall, that only one or most two men are needed among the fish in the cans and tanks, but under the present inadequate arrangements three must remain awake and about. Originally the car was equipped with upper and lower berths, but when the car was sent to the repair shops in 1904 for reconstruction by some misadventure only the lower berths were replaced.

During the spawning season for yellow perch, my brother A. G. Buller, superintendent of the Erie hatchery sent me several hundred thousand yellow perch eggs. They arrived in cans, some were hatched and others were hatching. The weather was exceedingly cold, and the temperature of the water was below 45. Whether

this was the cause or not, I cannot tell, but the fact remains that the little fish died almost immediately after emerging from the egg.

The men under me have been very faithful to their duties and exhibited deep interest in their work. I feel fortunate in having men like, B. O. Webster, Daniel Hauser and Harry J. Griffiths as assistants.

The output of trout and other fish from the hatchery will be found to be appended to this report immediately following the report of Mr. Safford.

The foregoing is respectfully submitted,

HOWARD M. BULLER,
Superintendent.

BELLEFONTE HATCHERY OUTPUT OF FISH FOR 1905.

Brook Trout Fingerlings Distributed to Each County from Bellefonte Hatchery No. 3 in 1905.

Bucks,	18,000
Berks,	130,500
Blair,	111,000
Bedford,	79,000
Centre,	382,500
Carbon,	39,000
Clinton,	18,000
Chester,	40,500
Clearfield,	142,500
Delaware,	1,500
Fulton,	6,000
Huntingdon,	147,000
Juniata,	13,500
Lebanon,	25,500
Lehigh,	69,000
Lancaster,	43,500
Mifflin,	28,500
Montgomery,	7,500
Northampton,	16,500
Philadelphia,	6,000
Perry,	57,000
Schuylkill,	40,500
Snyder,	73,500
Union,	207,000
Total,	1,704,000

BELLEFONTE HATCHERY, STATION No. 3.

Report of Acting Superintendent W. H. Safford.

Hon. W. E. Meehan, Commissioner of Fisheries:

I herewith beg to submit the following as my first report. On May 28 I resigned a position with the United States Government to accept your appointment as superintendent in Department of Fisheries of Pennsylvania, with orders to report to you at Harrisburg on June 1st. After arriving and reporting to you at Harrisburg I was at once detailed to Bellefonte station temporarily as assistant superintendent.

On July 1st owing to the continued ill health of the superintendent of Bellefonte station, I was placed as superintendent in charge and continued to serve as such until September 28, when I was transferred to Torresdale station.

I began my duties at Bellefonte by first thoroughly cleaning all ponds and grounds. Next I began the construction of two new trout ponds each 20 feet in width, 70 feet in length and two and a half feet deep, built of cement. Next we began constructing another trout pond, 30 feet in width, 40 feet in length and three feet deep. I desire to say here these three ponds practically were as fine ponds as I ever built.

After these three ponds were entirely finished I began the construction of a large dam, 100 feet in length, three and one half feet high, 10 inches thick of cement, across the headwaters of Logan Branch of Spring creek. This was to further increase the supply of water to the already constructed ponds of the station and to furnish water for the ones at that time proposed to be built at upper end of grounds. On August 1st contract was let by the Commissioner of Fisheries for new set of ponds, 13 in number.

Plans and specifications drawn by Commissioner and myself were accepted by contractor. Ground was broken for the ponds on August 1st, and they were completed early in September. These ponds are all 15 feet wide, 30 feet long and three feet deep and are constructed of cement, and when completed presented a fine appearance and added a vast amount of pond room to rear and hold yearlings and adult fish. This newly acquired water was brought from gateway in dam through a race about 500 feet where I constructed a cement receiving basin eight feet square and five feet in depth. From there to the raceway of the new group of ponds a water main was laid, 180 feet in length built of terra cotta pipe 20 inches in diameter connecting the receiving basin to the new group of ponds just completed. At the lower end of this group of ponds or overflow race, another main was laid 160 feet in length of 12 inch terra cotta pipe leading into one of the large ponds directly in front of hatchery, where from there it was carried through the entire number of ponds at the lower end of the station, thus giving nearly any quantity of water to the ponds.

Provision was also made in this new group of ponds to run water mains to different parts of the grounds in the near future. While speaking of ponds I may add that the large pond directly in front of the hatchery was cut in two by building a wall across centre making two very nice ponds 40 feet wide and 75 feet long.

I partially excavated and built cement wall on two sides of one of the ponds between the railroad and hatchery building which added greatly to the appearance of the grounds. I also made some needed repairs to some of the other ponds. This, I think, was about all the pond construction work I did while at Bellefonte station.

I then took up the grading of the grounds. This new group of ponds at the upper end of grounds that I speak of were not excavated but only trenched for a foundation. They were practically built on top of ground which required a great amount of grading. I built terrace five feet at top, eight feet at bottom around three sides of entire group of ponds, the upper end being brought to a level with side hill of the grounds finished up the looks of the ponds very nicely. Directly back of hatchery the grounds were very rough. I excavated a space 20 feet in width and 140 feet in length bringing that portion of the grounds to a level with the newly constructed ponds.

Between the gold fish pond and small fry pond was an unsightly gully directly at the front of the grounds which I filled and levelled off. This will add greatly to the lawn when seeded. I gave particular attention to the lawns in the way of cutting and trimming and keeping them clean. I also caused signs to be erected allowing no driving on lawns as visitors had become very careless and were driving almost anywhere.

I erected a very fine flag staff just at left of front of hatchery 60 feet in height. This was set in concrete five feet in depth. At the surface of the ground at base of pole I built circular platform of cement. I wish to say that not much attention has been given as yet to building driveways and walks with the exception of a very nice foot bridge built across pond at the rear of hatchery building.

The number of fish being reared in ponds at the station require a considerable amount of food which was being cut by a hand machine which took a great amount of the employes time to cut and prepare. This matter was looked into very carefully by the Commissioner and myself and deemed advisable to arrange to cut fish food by power. There being a small stream of water flowing down across the grounds, it was finally decided to locate the meat house on this stream. I built a dam at a point on the stream where I could raise the water to a depth of about four feet, built foundation walks on each side of stream and built the building 12 by 14 feet directly over stream.

Underneath the building at front and one side I constructed the flume for water wheel which was made of galvanized iron three feet in circumference and two and one half feet in diameter which made it very strong and durable. The object of building house directly over stream was two fold. First it was a direct channel to carry off all refuse from the building making it very easy to keep building and all equipments perfectly clean. Second, to get power as close to food cutting machine as possible. With this wheel and water power I had created I am confident it will run the meat chop-

per to cut all the fish food used inside of grounds in one hour and which when in operation will save a valuable amount of time.

This was the only new building erected on the grounds this year. All other buildings, superintendent's residence, hatching house and car barn were carefully repaired and painted. There was also placed on lower end of hatchery a sign bearing name and number of station. I placed small signs bearing name of fish over each pond so that visitors at station could readily tell species of fish in ponds.

At this time there was a valuable addition to the station in the purchase of adjoining land and buildings and water rights which now makes it a very complete station in every detail. The fish cultural duties at the Bellefonte station are of no mean importance containing as it does such a large number of ponds, also large number of fish requiring the utmost cleanliness of ponds and careful feeding of fish.

The condition of adult fish when I took station July 1st was excellent. The condition of fry or No. 1 and 2 fingerlings, as we term them now, was extremely poor, there being a vast amount of fungus that had completely invaded every fry pond at the station, not an epidemic of any kind, but owing to dirt and filth and some little to over-feeding, the death rate reaching quite good proportions. I at once began to give them vigorous treatment. I began by giving all No. 1 and 2 fingerlings affected salt baths twice a week until they began showing improvement, then dropped to one salt bath per week, then to one in two weeks until all signs of fungus had disappeared. In the meantime I had carefully cleaned all fry ponds drawing them down as dry as possible and salting sides and bottom, these ponds being built of cement are rapid producers of fungus and require a very thorough cleaning at least once a week. The condition of fish on a whole when I left the station was excellent.

Early in September owing to the near approach of the spawning season of the trout, I deemed it necessary to put the hatching equipment in condition to receive eggs. The receiving tank on one side of hatchery was carefully repaired and painted, hatching troughs and trays carefully looked over and painted, placing the hatchery ready to receive eggs the moment the fish began to spawn. I noticed on various occasions that the fish food in coming to the station would be in a very poor condition owing to the carelessness in the way it was packed for shipment, such as broken barrels which would expose it to the atmosphere and heat in warm weather, and sometimes being delayed in transit so that food on arriving at station would sometimes be utterly useless and more often very very poor. I would recommend that something in the shape of fish food shipping cases be made so that food would reach station in better condition.

The depredations of water animals among the fish were very small.

The work of frog culture was started by enclosing one of the already constructed ponds beginning with a board at bottom 12 inches wide nailed to stakes firmly set in ground with wire screen three feet wide on top of this board. At top of screen incline pieces 12 inches wide were nailed to which was fastened a strip of cloth 12 inches wide. This is necessary for the fact that adult frogs during the coming of a storm are inclined to jump and climb to quite an extent. Between 35 and 40 adults were placed in this pond which produced at the start between two and three thousand tadpoles,

of these about 1,00 began growing very nicely and there is no question as to the number that can be hatched and reared at Bellefonte station.

In the matter of gold fish at the station, considering it was the first year they were there and the limited space they were given, they did very nicely. As to the number of ponds and fish therein, quantity and quality of water, I consider the Bellefonte station the equal of any in the Union. The grounds need a vast amount of work and quite an expenditure of money to be in first class condition; but with the very progressive spirit of the Commissioner of Fisheries in a very short time this will all be accomplished. When this is done there will not be a hatchery found any better.

In closing my first report to you on the Bellefonte station, I desire to mention the valuable services rendered me by Messrs. Daniel Houser and Harry J. Griffith, the two regular employes. They are very able young men and a credit to the Department whose services I value very highly. All of which is respectfully submitted.

I am your obedient servant,

W. H. SAFFORD,

Supt. in Charge Bellefonte Hatchery, Station No. 3.

WAYNE COUNTY HATCHERY, STATION No. 4.

Report of Nathan R. Buller, Superintendent.

To the Members of the Fishery Commission:

Gentlemen: I herewith submit my annual report of the Wayne Fish Hatchery No. 4, from January 1st, 1905, to December 1st, 1905.

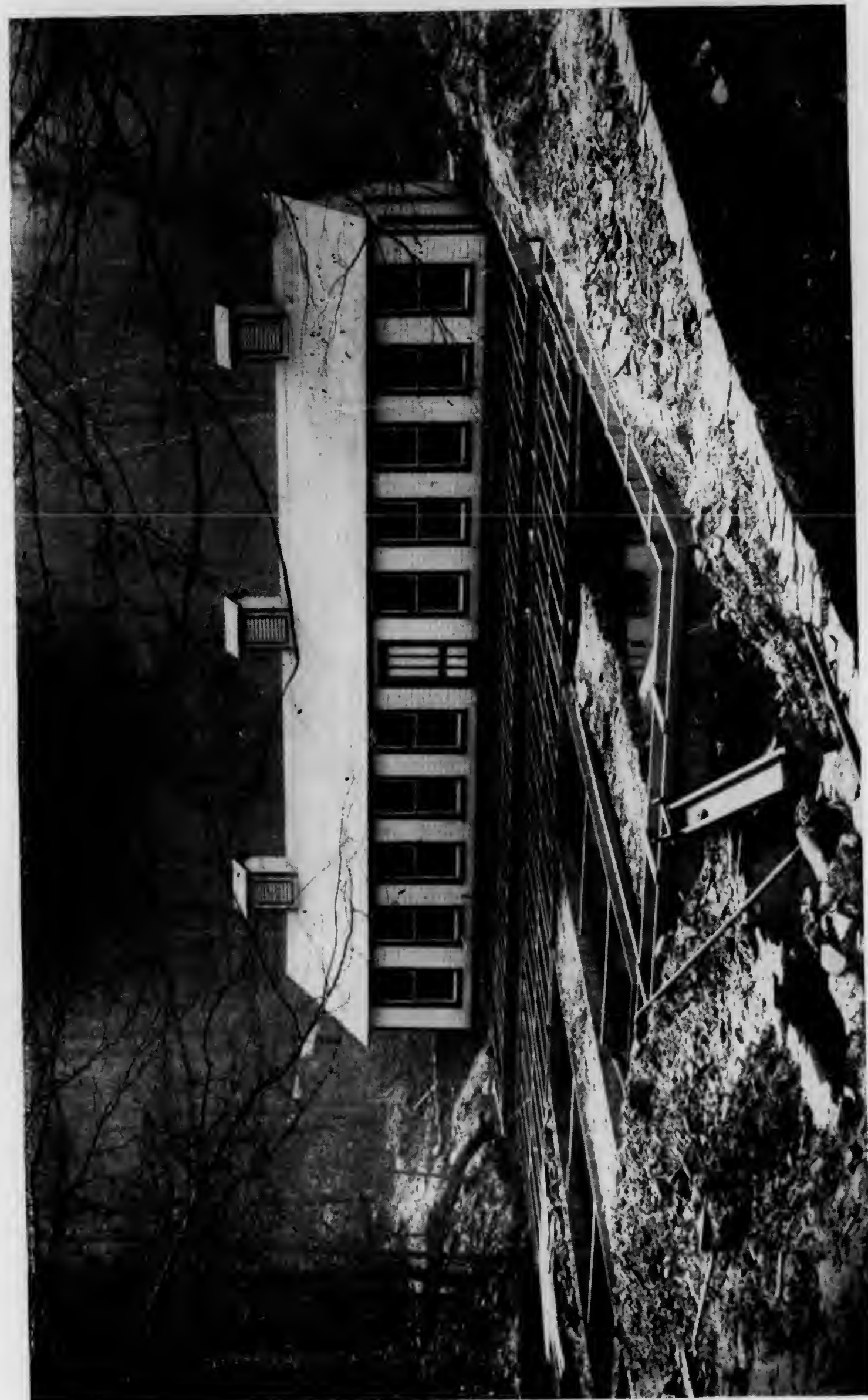
Continuing from my last year's report of brook trout work, I feel very much gratified with what was done by the end of the distribution season. Taking into consideration the extreme cold weather and the heavy snow falls in Wayne county during the months of January and February, we are entitled to self praise since the severe weather entailed a great deal of extra work upon the employes of the hatchery. We had frequently three to four feet of snow to shovel from the ponds and twenty-four inches of ice to cut in order to feed the adult trout, but the work was kept constantly moving.

The eggs in the hatchery had all hatched by February 2nd. Owing to the great amount of eggs and limited room in the hatchery, I removed the heating stove, which gave room for an additional pair of troughs. I also built forty-four troughs during the season on the south side of the building, making at the present time seventy troughs, inside and out, available for trout fry. Twenty-four of these troughs were not completed until after the spring distribution of the trout. As last spring was the first season of fish hatching at the Wayne hatchery, I felt very nervous lest there be some slip and consequent failure, and the nervousness was justifiable for we were carrying from 25,000 to 30,000 advanced fry in each trough; but by careful attention and hard work, I take pride in stating that we succeeded in planting as fine a lot of trout in the various streams throughout the eastern and northeastern section of the State that has ever been sent out from any hatchery.

I have considered in reading previous reports that the Department of Fisheries was not receiving the proper credit for the work it was accomplishing hitherto. The hatcheries were credited with planting trout fry where in reality they were planting fingerlings.

From the standpoint of the fish culturist there is a vast difference in the work of hatching eggs and planting what are termed fry, and feeding the fish up until they reach the stage of fingerlings. All fish culturists know that very little work and knowledge is required to carry the fish through the sac period, as they can be crowded very thickly in the troughs and do well up to the time of the absorption of the sac and feeding begins, but from that stage on, until they reach the age of four months, is the time the fish culturist must bring all his knowledge to bear on his charge and give constant, daily and even hourly attention to every trough of fish he has in his house. If at the end of the four months he has met with no mishap and his troughs are full of healthy fish, he can pat himself on the back and say, "I did it."

At the order of Commissioner Meehan, during the month of Feb-



Wayne Hatchery. Exterior Hatchery House. Outside Nursery Ponds and Troughs.

WAYNE COUNTY HATCHERY, STATION No. 4.

Report of Nathan R. Buller, Superintendent.

To the Members of the Fishery Commission:

Gentlemen: I herewith submit my annual report of the Wayne Fish Hatchery No. 4, from January 1st, 1905, to December 1st, 1905.

Continuing from my last year's report of brook trout work, I feel very much gratified with what was done by the end of the distribution season. Taking into consideration the extreme cold weather and the heavy snow falls in Wayne county during the months of January and February, we are entitled to self praise since the severe weather entailed a great deal of extra work upon the employes of the hatchery. We had frequently three to four feet of snow to shovel from the ponds and twenty-four inches of ice to cut in order to feed the adult trout, but the work was kept constantly moving.

The eggs in the hatchery had all hatched by February 2nd. Owing to the great amount of eggs and limited room in the hatchery, I removed the heating stove, which gave room for an additional pair of troughs. I also built forty-four troughs during the season on the south side of the building, making at the present time seventy troughs, inside and out, available for trout fry. Twenty-four of these troughs were not completed until after the spring distribution of the trout. As last spring was the first season of fish hatching at the Wayne hatchery, I felt very nervous lest there be some slip and consequent failure, and the nervousness was justifiable for we were carrying from 25,000 to 30,000 advanced fry in each trough; but by careful attention and hard work, I take pride in stating that we succeeded in planting as fine a lot of trout in the various streams throughout the eastern and northeastern section of the State that has ever been sent out from any hatchery.

I have considered in reading previous reports that the Department of Fisheries was not receiving the proper credit for the work it was accomplishing hitherto. The hatcheries were credited with planting trout fry where in reality they were planting fingerlings.

From the standpoint of the fish culturist there is a vast difference in the work of hatching eggs and planting what are termed fry, and feeding the fish up until they reach the stage of fingerlings. All fish culturists know that very little work and knowledge is required to carry the fish through the sac period, as they can be crowded very thickly in the troughs and do well up to the time of the absorption of the sac and feeding begins, but from that stage on, until they reach the age of four months, is the time the fish culturist must bring all his knowledge to bear on his charge and give constant, daily and even hourly attention to every trough of fish he has in his house. If at the end of the four months he has met with no mishap and his troughs are full of healthy fish, he can pat himself on the back and say, "I did it."

At the order of Commissioner Meehan, during the month of Feb-



Wayne Hatchery. Exterior Hatching House. Outside Nursery Ponds and Troughs.

ruary, I made an experiment of freezing six fingerling brook trout into a cake of ice. On melting the ice, I found two out of the six alive. My test was very severe, much more severe than fish could possibly experience in a stream. In reference to this, I will state here that I had an non-intentional experience of trout freezing in the ice in one of the pools on the hatchery.

The water supply in one of the pools, during very severe cold weather, was shut off and it was impossible to start the flow of water until we had a thaw. I remember rightly, there were about 15,000 to 20,000 fingerling trout in the pools. They were practically frozen into a solid mass of fish and ice. On the waters commencing to flow again the ice melted and much to my delight there was only a loss of a few trout. This pond was not disturbed, I left nature take its course.

During the season, I constructed a series of pools forty feet long, twenty feet wide, three feet deep, the water supply being taken from the Lackawaxen river. These pools were constructed with the intention of placing the brook trout therein that were to be kept for breeders.

I also constructed a series of four pools opposite the fry pools which were fed from the same source of water, for adult trout of which I had a few hundred, which were presented to the Department by the Blooming Grove Park Fishing and Hunting Club.

Much to my chagrin during the month of August, the water being very low in the river the temperature in the ponds rose to eight degrees Fahrenheit which put an end to most of the trout before they could be removed. I might say in this connection this work was all done in a hurry and the water supplies was brought from the river, in open ditches, which went far towards warming it up. I still consider at some future time these ponds can be used for the work they were intended, by bringing the water in covered trunks and thoroughly shading the pools. While we have ample supply of spring water, it was not available at the time, for the construction of our ponds. But since this occurrence I have constructed four nursery pools, thirty feet long by nine feet wide, and three feet deep, with available space for two more, giving us ample room for yearling fish.

I have also constructed at the outlet of the nursery pools, one breeding trout pond forty-five feet long, by eighteen feet wide and there is still space available for one more pool, fifty feet long by eighteen feet wide. Then by crossing the road-way with out water supplies we enter an old abandoned pool that was built a great many years ago and at a very small cost. This can be cleaned out and used for adult trout. The temperature of these ponds never exceeded fifty degrees Fahrenheit even after reaching the large pool, as there are innumerable small springs all along the mountain side which empty direct into the ponds. I consider after this work is all completed we can hold adult trout enough to produce about 4,000,000 eggs which will be about the limit of brook trout of the Wayne hatchery.

On January 28th, I received 5,000 Atlantic salmon eggs from East Oreland, Maine. They arrived in fine condition, although I had a desperate time to get them to the hatchery, the snow being three feet deep in the level, the roads drifted so full that a team could

no be used. We carried the eggs from the depot to the hatchery, taking almost a day to travel the three miles there and back. These eggs hatched in about twenty days after their arrival. The fry did well up until the month of August.

Owing to my previous experiment with Atlantic salmon, which was at the Bellefonte hatchery, I had great trouble getting them to feed. But on this lot of fish I experimented with a new method. Knowing that these fish are migratory and ascend the rivers the same as a shad, I thought probably by adding a little salt to their food, they would take it, much to my pleasure I found they fed very ravenously on food mixed with salt. Having no special ponds built for the care of salmon, I placed them in the same ponds that were constructed for brook trout, with the water supply from the Lackawaxen river. I had the same fatality with them as with the brook trout, the water reaching a temperature of 80 degrees.

As we are all very much interested in the propagation of Atlantic salmon, I would suggest to you when you have the money available to build a hatching house and a series of pools, for the retention of fry, on the west side of the property.

We have as large a supply of spring water on the west side of the property as we have on the east side, that we are now using for brook trout. I feel assured if we pursue this plan, we will be able to successfully hatch and grow Atlantic salmon. I know that you are very much interested and will strain every effort to make the Delaware river an Atlantic salmon stream. This accomplished the work will be a monument to you, and I very believe that it can be done.

I understand they are successful in impounding adult fish in East Oreland, Maine, and I suggest for the benefit of the Department, that in the near future you allow the superintendent who has charge of Atlantic salmon work, to pay a visit to the East Oreland hatchery, so that he can by an ocular demonstration learn the methods they are using. Another suggestion I would make is to have a supply of eggs coming each season, until we solve the problem.

Referring again to the water supply on the west side of the property, there is no season of the year that the water attains a higher degree of temperature than fifty degrees Fahrenheit.

It gives me great satisfaction that I was able to add materially in 1905, to the knowledge already gained by the Department in the experiments in frog culture which it began two years ago at the Corry and Erie hatcheries. That the efforts initiated by the Pennsylvania Department of Fisheries to solve the problem of frog culture, is regarded by fish culturists all over the country is proved by the number of letters received by me, from nearly every State in the Union, and by the great number of applications for frogs, made by Pennsylvanians and turned over to this hatchery to be filled.

The beginning of the work was both sudden and unexpected, and it came about in rather an odd way. Mr. Meehan was on one of his inspection trips to the Wayne hatchery, and one morning crossing the grounds to where I was directing men at work on a bass pool, asked me what had given me the idea of starting in the frog business, and he wanted to know if it were on account of having heard that my two brothers at the Corry and Erie hatcheries were experimenting with them. I replied in some astonishment that I had not

done anything in frog culture and had not been thinking of it, and that I did not know my brothers were doing anything in that direction. He then took me a natural pool below one of the ponds and pointed out a great quantity of frog spawn and young tadpoles, and observed that I had better "get about the work at once," that with the material in front of me I should be able to make a generous output that year from the hatchery. Even then I scarcely comprehended his meaning, and then he informed me, that he regarded the frog as one of the coming great industries in the country, and that he proposed to encourage it to the full extent of his power. That there were many difficulties in the way of success and that the experiments at Corry and Erie had for two years been quietly experimenting with the creatures, that Erie had produced 30,000 the year before, and that he wanted the resources of all the hatcheries taxed to their utmost and the earnest skill of all the superintendents devoted to the successful rearing of frogs by the million in each station.

Within half an hour I had the employes of the station enlarge the pool to which my attention had been directed, and before nightfall had a body of water, fifty feet long, thirty feet wide and from six inches to one foot deep.

I then proceeded to gather all the spawn that I possibly could care for in my limited quarters. This was on or about the middle or the latter part of April. This being a new work to me I gave very careful attention. The eggs were as far as I can tell about twenty to twenty-five days in the process of incubation. They remained in the tadpole stage about sixty days.

The hatching of the spawn and the taking care of tadpoles is not as simple as I at first supposed, as the tadpole, like everything else that becomes valuable, is subject to disease, especially if overcrowded, although fortunately Wayne hatchery slipped through clear.

While in the tadpole stage they are great feeders and must be constantly provided with fish. The quantity of 50,000 or 60,000 tadpoles can devour in a week almost surpasses belief. Fish was the only food up to the present time that I have discovered they would take. In speaking of the fish as food, I refer to dead fish, for naturally live fish is beyond their reach. These can be brought in the fish markets in any city at a small cost. It was quite amusing to me to watch what followed when I placed the fish in the pond. With astonishing quickness the tadpoles would collect from all quarters and literally cover the fish and adhere to the carcass, on which they would feed until there was nothing but the skeletons left. A four pound fish would be completely skeletonized in less than five hours.

Every epicure considers the brook trout the finest flavored fish that swims in the waters, it having a delicate flavor which no other fish possesses. As was natural in a population of trout as large as is in our ponds some adults died from time to time and when such incidents occurred we utilized the dead trout for tadpoles to feed upon. It was a noticeable fact that in each instance, although there might be the carcasses of other species thrown in at the same time, the tadpoles would generally attack the brook trout first and leave the other species until they were entirely eaten up, showing conclusively that they discriminated and enjoyed brook trout in preference to other fish.

On or about June 25th, I noticed by first frogs. Then the tug of war commenced. Tadpoles developing into frogs by the thousands daily forced a question of live food, for frogs unlike tadpoles are not scavengers and will not eat dead food. How to procure or manufacture this was quite a problem to solve.

I first introduced into ponds and yards, boards covered with sweet substances, such as molasses which attracted flies. On these the small frogs very readily fed, keeping the boards surrounded all the while. But I do not think this would be a sufficient amount of food. If the frogs had to be maintained for any length of time.

In passing back and forth from my dwelling to the hatchery I noticed in the roadway, myriads of small flies collected around the various heaps of refuse and horse manure. I came to the conclusion that by keeping an amount of this in the frog yards, it would attract ample food, for the frogs owing to the large number of insects which were constantly attracted there. This I found to be correct, and the frogs grew rapidly both in size and fatness.

The question of food for the frogs was not the only trouble which confronted me. It became now a question of protecting them from their enemies, which I found were quite numerous, first in the list was some older frogs which I had kept in the yard, these I found were eating the tadpoles. I immediately removed every frog that was in the yard. The next enemy I found in going to the hatchery early one morning was a lot of crows having a feast on young frogs, that necessitated covering the yard with wire netting. Another enemy to be guarded against is the water snakes. These enemies can all be provided against by the proper construction of yards.

I made my first shipment of frogs on July the 5th, and the last shipment on September 21st. My space devoted to this work was very limited being a yard thirty feet wide by fifty feet long.

In describing the construction of the yard and pool which I think is about the proper dimensions, should be constructed in the following manner; excavate the side so there is a depth of water at the outer edges of about six inches, centering into a pool with a depth of three feet. The bottom of the ponds should be mud from six inches to a foot deep. The inlet and supply of water should be conducted through a pipe that you had absolute control of as there is periods in the incubation of eggs and the stage of tadpoles that the flow of water must be regulated according to their wants. Generally there should be neither inflow or outflow or very little because the warmer the water the more rapidly and vigorously the tadpoles and frogs seem to grow.

The outlet of the pond, should be constructed in a manner to draw the pond perfectly dry when necessary. Surrounding the pond between the water and the fence there should be a space of grassy land at least 2 feet wide. This is a necessary adjunct on account of the frogs after they are hatched.

There should also be obstructions on the grassy land. These may be pieces of wood three to four inches square placed at intervals of two and three feet. The obstructions are to keep the frogs from huddling in one mass, as they are apt to do if there is only the corners in the yard. Each one of these ponds or yards, in order to confine the frogs must be fenced and built very securely. My method was to sink a twelve inch board at least four inches under the ground,

the remaining eight inches above in order to fasten the wire thereto. The top railing should be a board six inches wide, one inch thick and a height of thirty-two inches. The fence proper should be common wire mosquito netting. The fence alone, will not keep the frogs in the yard as they climb the fence and go out over the top. In order to avoid this, we placed projections 12 inches each, inside the fence and covered with a piece of muslin this prevented the frogs from getting out.

As a result of my experiments last year, I shall be more careful with the amount of food required and the different temperatures of the water to grow a certain number of frogs, and more carefully preserve all concerning the work. This much I have learned that frog culture is not child's play. It requires a great deal of labor and constant attention to achieve success. To afford an idea of how many frogs can be grown into the size of two inches in length in the yard that I mentioned, I will say my distribution was 60,900.

I not only find that there is a great demand in the city markets for the edible frogs and in this I am supported by the Commissioner who informs me that there is more propagation in America in six months than in any other country in a year, but there is still another demand that probably equals the food end of the question, namely, that among the fishermen with whom tadpoles and frogs are in great demand as bait for catching the different game fish.

An interesting experiment that I am making, after finishing up the shipments is that I have placed 250 adult frogs in this same yard to find out how they wintered and what condition they come out after their period of hibernation has ended. I have also approximately the number of young frogs in order to ascertain exactly how long it requires to bring them to maturity. The depth of the water in this little pond, is as I have mentioned, three feet in the centre with probably a foot of mud in the bottom. They disappeared about the middle of November, since that time the pond has been covered with ice and there is probably eight inches of ice on the pond, this being the latter week in December. Before spring I intend to cut through this ice and take up a number of frogs to find out there condition. These experiments I will embody in one of my monthly reports.

During the month of August, I received from the superintendent of the United States Fish Commission, of the Leadville Hatchery, Colorado, seventy-five thousand cut throat trout eggs. They came in very fine condition, hatching out fifteen days after their arrival in water of a temperature of 47 degrees. The treatment of the fish was the same as brook trout. By the direction of the Commissioner I planted them, with the exception of 5,000, which I kept for breeding purposes, in three different lakes, one in Wayne county, one in Susquehanna county and one in Lackawanna. I did this in December, when they were planted as fingerlings Number 1, being on an average of an inch and a half in length. As I understand it the cut throat trout is a species of fish that has never been introduced into waters of the State of Pennsylvania previous to this planting, and it was on this account the Commissioner ordered me to plant them myself and not allow them to go out on application. It was he also who filled the lakes in which they were deposited.

From the little information I have gained in regard to this trout,

Wayne Hatchery. Interior Hatching House Showing Trout Troughs and Battery Troughs.



the remaining eight inches above in order to fasten the wire thereto. The top railing should be a board six inches wide, one inch thick and a height of thirty-two inches. The fence proper should be common wire mosquito netting. The fence alone, will not keep the frogs in the yard as they climb the fence and go out over the top. In order to avoid this, we placed projections 12 inches each, inside the fence and covered with a piece of muslin this prevented the frogs from getting out.

As a result of my experiments last year, I shall be more careful with the amount of food required and the different temperatures of the water to grow a certain number of frogs, and more carefully preserve all concerning the work. This much I have learned that frog culture is not child's play. It requires a great deal of labor and constant attention to achieve success. To afford an idea of how many frogs can be grown into the size of two inches in length in the yard that I mentioned, I will say my distribution was 60,900.

I not only find that there is a great demand in the city markets for the edible frogs and in this I am supported by the Commissioner who informs me that there is more propagation in America in six months than in any other country in a year, but there is still another demand that probably equals the food end of the question, namely, that among the fishermen with whom tadpoles and frogs are in great demand as bait for catching the different game fish.

An interesting experiment that I am making, after finishing up the shipments is that I have placed 250 adult frogs in this same yard to find out how they wintered and what condition they come out after their period of hibernation has ended. I have also approximately the number of young frogs in order to ascertain exactly how long it requires to bring them to maturity. The depth of the water in this little pond, is as I have mentioned, three feet in the centre with probably a foot of mud in the bottom. They disappeared about the middle of November, since that time the pond has been covered with ice and there is probably eight inches of ice on the pond, this being the latter week in December. Before spring I intend to cut through this ice and take up a number of frogs to find out there condition. These experiments I will embody in one of my monthly reports.

During the month of August, I received from the superintendent of the United States Fish Commission, of the Leadville Hatchery, Colorado, seventy-five thousand cut throat trout eggs. They came in very fine condition, hatching out fifteen days after their arrival in water of a temperature of 47 degrees. The treatment of the fish was the same as brook trout. By the direction of the Commissioner I planted them, with the exception of 5,000, which I kept for breeding purposes, in three different lakes, one in Wayne county, one in Susquehanna county and one in Lackawanna. I did this in December, when they were planted as fingerlings Number 1, being on an average of an inch and a half in length. As I understand it the cut throat trout is a species of fish that has never been introduced into waters of the State of Pennsylvania previous to this planting, and it was on this account the Commissioner ordered me to plant them myself and not allow them to go out on application. It was he also who filled the lakes in which they were deposited.

From the little information I have gained in regard to this trout,



Wayne Hatchery. Interior Showing Trout Troughs and Battery Troughs.

I understand they inhabit the different lakes and many streams in the Pacific slope, and in the former waters they attain a size or eight to ten and even more pounds. At the present time the Commissioner states he does not feel justified in allowing them to go into the trout streams, until it is demonstrated that they are less harmful than the brown trout proved to be. If they thrive in the lakes they should be a valuable addition of fish for our sportsmen, as I understand they are surface feeders. Knowing very little of the habits and environments of the fish, I will anxiously await developments. I trust that you will be able to secure for me each season a similar quota of eggs, until such time as we are able to grow the fish to an adult size. This is very important in order to make this effort of yours in the interest of the sportsmen a success.

By your advice in September of 1904, I constructed a pool for the purpose of impounding adult chain pickerel, with the intention of collecting their eggs and making an effort to artificially propagate them. This I believe is the first attempt ever made by any State in that direction. From data given by the Commissioner during his inspection trips and knowing the character of the north eastern section of the State of Pennsylvania. I felt that the orders of the Commissioner to begin the propagation of chain pickerel wise and timely.

If my memory serves me rightly in Lackawanna, Luzerne, Wayne, Pike, Monroe and Susquehanna counties there was an aggregate of over 400 lakes varying in dimensions from fifty acres to 500 acres each. Most of these lakes are what are termed kettle holes, that is having no visible inlet, but deriving their water from springs in the bottoms but many are inlet lakes with mud bottoms and thickly planted with water lilies. Most of the kettle hole lakes in early years were inhabited by brook trout; but with the passing of the forest land the waters have become slightly better adapted for bass and especially pickerel.

At the present day fishermen can at most any time be rewarded with a fair days catch, especially since the prohibition of unrestricted ice fishing; but it is noticeable that the pickerel caught are smaller in size than they were in previous years, due I think in some measures to inbreeding from year to year, the importance of an infusion of new blood therefore can be readily seen. I feel assured in a few years, if we are enabled to pursue the work we have begun and have planned this season, under the instructions of the Commissioner, made arrangements with many of the owners of these lakes to collect eggs from one body of water and restock the lakes with fish taken from some different lakes. I feel assured that this method of infusing new blood will eventually increase the size of fish.

The pool I mentioned having been constructed through the courtesy of the Wild Wood Park Association in Wayne county, we were enabled on the 8th day of October, 1904, to place therein 200 adult pickerel, averaging in weight from two and a half to three pounds. They were transported from their lake to the Wayne hatchery, a distance of thirty-two miles by wagon, with the loss of only twenty-five fish. I wintered these fish in comparatively good condition, although we experienced a very severe winter, the thermometer ranging for weeks from eight to thirty degrees below zero. The pond was covered almost continuously with twenty inches of ice, making it impossible to feed the fish artificially during the win-

ter. In contemplating and looking forward to the experiments which we wanted to make in the spring, I felt very dubious about having any fish left.

During the month of April the ice began to leave the ponds and it melted away from the shores. Much to my pleasure I found the fish there ready for business.

Not having any battery erected in the hatchery, I constructed a temporary battery at the foot of our small mouth black bass pond, large enough to place twelve jars. As soon as the ice had left the ponds sufficiently to operate the seines, I caught the fish and transferred those which were ripe to tanks I had arranged in the hatchery.

Much to my chagrin after expressing the eggs from the first ripe female, I could not express any milt from the males, so my first day's work was a loss. Allowing a few days to elapse I made another attempt and collected eggs sufficiently for my jars.

In expressing the eggs from the female and expressing the milt from the male, I found I had a glutinous mass beyond anything I had ever experienced before. Now the difficulty arose, how to separate the eggs? As the attempt had never been made before to my knowledge, I continued on the same lines and methods that are used in the separating of the wall-eyed pike eggs, using a portion of corn starch and water and stirring continually. I found after fifteen or twenty minutes, the eggs had separated. I then placed them in a hatching jar. The circulation of water through the jars kept the eggs in constant motion and I found that very little bunching or clogging of eggs occurred, and hoped to bring this hatch to a successful stage.

Much to my chagrin, on going to the hatchery one morning I found that some party or parties had placed the gates in the reservoir, situated on the head waters of the Lackawaxen river cutting my water supply entirely off. The consequence was that I lost 1,000,000 of eyed pickerel eggs. This was a very serious loss for the season was now advanced. I nevertheless sought the lakes in the vicinity in the hope I might find naturally deposited eggs. I was successful beyond my hopes. The eggs that I had in the jars were already eyed when the mishap noted occurred, showing conclusively that chain pickerel eggs can be hatched in jars as easily as wall-eyed pike, white fish or shad. The temperature of the water during these operations was on an average 38 degrees Fahrenheit.

I collected eggs from the lakes, transporting them to the hatcheries and hatched them on trays.

I might describe for the benefit of the fish culturist and others in what places we found these eggs. The first lot of eggs was from Wild Wood Park, a lake situated about thirty-two miles from the hatchery. On my first arrival at Wild Wood, I found the water of the lake very rough as the wind was blowing high and the man who had charge of the lake was afraid to venture on with the boat. Knowing the importance of getting the eggs I persuaded him to take me out. With my limited knowledge of the habits of the chain pickerel, I was under the impression that I would find these eggs in the grass and weeds surrounding the lakes, but before the day was over, I found I was mistaken, as in all my quests on the different lakes, I found that pickerel had deposited their eggs wherever

there was a clump of stumps or sunken logs. This is their spawning place, and it was a noticeable fact that some of the strings or as one might say clusters of eggs, would fill as much a four quart pail. All deposited by one fish.

The results of the first day's work were placed in a shipping can in water, transported to the hatchery and placed on trays.

I did not attempt to clean up these eggs as I found they hatched very satisfactorily on the trays in the natural clusters. The product of this and other lakes when hatched was immediately shipped and placed in the different lakes in the north east. I will say in this connection, for the benefit of anyone who attempts the propagation of pickerel that they should not attempt it in spring water, the water must be taken from creeks or ponds. For some unaccountable reason spring water is certain death to the small fish.

Other attempts in transporting eggs were made in our regular shipping cases, placing the eggs upon flannel trays with a perforated box full of ice on top. The melting of the ice kept the eggs moist during the transportation. I find this much the best method of transportation as the eggs in the cans of water are very apt to smother.

During the month of May, in looking over my pickerel breeding pond, I noticed a number of small pickerel about an inch in length. These were hatched from some few eggs that I had missed. Here was a point now for another experiment, but with what success I could not at the time say, as the adult breeding pickerel were in this same pond. The pond was entirely free from vegetation. In order to save these little pickerel it was necessary to provide shelter and feeding grounds. I had the employees place brush in the water all around the pond and this afforded hiding places for them, out of reach of the older fish.

I watched these pickerel during the season to find out upon what they were feeding.

During their earlier period of life, am satisfied they feed entirely upon daphnia and later on a small black insect which covered the water. They fed greedily on the latter. I think that up to the age of three and four month, when they are four or five inches, they feed principally upon foods mentioned. After that their principle food is small fish.

The experiment with these young pickerel ended the first of October. When they were taken from the pond, their average growth was four inches. I would like to this coming season devote several of the ponds to the purpose of growing pickerel to fingerling size. In view of the experiment which we have made with the chain pickerel I have asked Mr. Meehan's permission to erect a battery for the hatching of pickerel eggs, for the reason that I consider it the best method of hatching eggs in large quantities. He granted my request and authorized me to erect a four trough battery in my brook trout hatchery. This battery is nine feet high and sixty-five feet long. When equipped will support 300 Meehan jars. I might say in this connection, each jar is seventeen inches high, has a width of six and six-eighth inches at the top and six and a half inches at the bottom. The battery is supplied through a six inch pipe of water

taken from the Lackawaxen river flowing by gravity. I have also; in connection with the battery, run a line of two inch iron pipe against every trough with a spigot that I can tap Lackawaxen river water into any trough on the plant independent of spring water.

It is my intention after the disposal of the trout to utilize these troughs for pickerel and perch work.

I feel exceedingly sorry to report my attempt at rearing small mouth black bass at the Wayne hatchery the year 1905, an entire failure. I have read a great many reports of the different attempts on the rearing of small mouth black bass. I have also visited several hatcheries and also paid very strict attention to the remarks and discussions of that important fish at the time I attended the meeting of the American Fisheries Society, held at White Sulphur Springs, West Virginia. In the work at Wayne, I followed what seemed to me to be the best information obtainable.

The pond which I was making these attempts in the propagation of the small mouth black bass is in area about one and third acres, extending in depth from two inches to eight feet. The greatest area of the pond varies in depth from 18 inches to three feet. On this table land, or more properly shelf I placed sixty box nests made similar to the nests used in the Michigan hatcheries, and invented by Mr. Lydell.

I gave all the attention I possibly could spare to watching to discover whether the bass occupied the nests, but I failed to find that they did so. However, I was still in hope that they might have spawned in places outside the nests which were undetected by me. But in October, when I drew off the water and took out the parent fish, which were in fine and healthy condition, I found not a single young small mouth black bass.

In taking up the parent fish, I found a few pair of rock bass, and about 6,000 young which they had hatched and reared. These young rock bass were taken out and distributed in different waters. They were one and one-half inches in length at the time of distribution. There are different causes to which I attribute my failure; one was the absence of any aquatic growth in the pool, a reason to which I attach some importance. It is a reason which cannot exist next summer for I have planted quite a quantity of chara plant, conceded to be the best insect growing plant in the west. Another reason for failure undoubtedly was that I did not have perfect control of the water supply. The pond was hastily built and the water supply was from a ditch directly from the Lackawaxen. Often times when the water rose in the creek the ditch would be bank full, and there was consequently a very large flow of water through the pond which we could not avoid. That is guarded against now, however, for we have absolute control of the water supply, it entering the supply ditch from a controllable supply in a sluiceway.

Another reason and in all probability the one cause of the failure to hatch bass last spring was the extreme low temperature of the water. During the entire spawning season, the spring was exceedingly cold and it is a well known fact that small mouth black bass will not spawn when the temperature is under 50 degrees Fahrenheit and that any eggs which may be deposited will die if the temperature falls as low as 45 degrees. During the spawning season of bass in 1905, the temperature at no time reached 50 degrees and on June



Wayne Hatchery. Pickerel Fry Ponds.

taken from the Lackawaxen river flowing by gravity. I have also; in connection with the battery, run a line of two inch iron pipe against every trough with a spigot that I can tap Lackawaxen river water into any trough on the plant independent of spring water.

It is my intention after the disposal of the trout to utilize these troughs for pickerel and perch work.

I feel exceedingly sorry to report my attempt at rearing small mouth black bass at the Wayne hatchery the year 1905, an entire failure. I have read a great many reports of the different attempts on the rearing of small mouth black bass. I have also visited several hatcheries and also paid very strict attention to the remarks and discussions of that important fish at the time I attended the meeting of the American Fisheries Society, held at White Sulphur Springs, West Virginia. In the work at Wayne, I followed what seemed to me to be the best information obtainable.

The pond which I was making these attempts in the propagation of the small mouth black bass is in area about one and third acres, extending in depth from two inches to eight feet. The greatest area of the pond varies in depth from 18 inches to three feet. On this table land, or more properly shelf I placed sixty box nests made similar to the nests used in the Michigan hatcheries, and invented by Mr. Lydell.

I gave all the attention I possibly could spare to watching to discover whether the bass occupied the nests, but I failed to find that they did so. However, I was still in hope that they might have spawned in places outside the nests which were undetected by me. But in October, when I drew off the water and took out the parent fish, which were in fine and healthy condition, I found not a single young small mouth black bass.

In taking up the parent fish, I found a few pair of rock bass, and about 6,000 young which they had hatched and reared. These young rock bass were taken out and distributed in different waters. They were one and one-half inches in length at the time of distribution. There are different causes to which I attribute my failure; one was the absence of any aquatic growth in the pool, a reason to which I attach some importance. It is a reason which cannot exist next summer for I have planted quite a quantity of chara plant, conceded to be the best insect growing plant in the west. Another reason for failure undoubtedly was that I did not have perfect control of the water supply. The pond was hastily built and the water supply was from a ditch directly from the Lackawaxen. Often times when the water rose in the creek the ditch would be bank full, and there was consequently a very large flow of water through the pond which we could not avoid. That is guarded against now, however, for we have absolute control of the water supply, it entering the supply ditch from a controllable supply in a sluiceway.

Another reason and in all probability the one cause of the failure to hatch bass last spring was the extreme low temperature of the water. During the entire spawning season, the spring was exceedingly cold and it is a well known fact that small mouth black bass will not spawn when the temperature is under 50 degrees Fahrenheit and that any eggs which may be deposited will die if the temperature falls as low as 45 degrees. During the spawning season of bass in 1905, the temperature at no time reached 50 degrees and on June



Wayne Hatchery. Pickerel Fry Ponds.

14th, it was 44 degrees. I have taken measures which I think hereafter will tend to keep the temperature at a higher rate in the future even if the weather temperature be below normal. As I have absolute control of the water supply to suit our needs, I can regulate the flow and is necessary stop it entirely.

I suppose I may take comfort in the thought that I am not the only superintendent in the country that made a failure in 1905, notwithstanding this I assure you I feel extremely sorry to report this failure, as you and the Commissioner have always been very much interested in the success of small mouth black bass and are urgent for hatching on a large scale.

I think I can agree with Mr. Frank Clark, superintendent of the Northville station, Michigan, when in his paper he says, "In order to obtain the best results at a small mouth black bass breeding station, the ponds should not be too large or too deep, but have plenty of them. It is preferable that they be from one-half to and over three-fourth of an acre in area, in a maximum depth of six feet in about one quarter of the pond."

Acting under the direction of my Chief, Mr. Meehan, I have taken up the study of yellow perch to find out the best technical methods of propagation. And I herewith take pleasure in setting forth the results of my efforts and experiments to this date.

In the season of 1905, the first perch which commenced to spawn at this hatchery, was on April 15th, and duration of spawning period was until May 12th. One experiment made was with a pond the dimensions of which were fifty feet wide by one hundred feet long. There was an average depth of three feet throughout. At the time of placing the eggs in the pond, I had every reason to believe that there would be a successful hatch, for this method had been successfully done in previous years by A. G. Buller and William Buller at the Corry and Erie hatcheries. The first eggs were placed on brush. The tops of the brush extended out of the water from 12 to 18 inches and the strings of eggs were placed on the brush underneath the water. The idea of the tops of the brush extending out of the water was to create a motion to the eggs by the branches being swayed by the wind, as it was well known that if fish eggs lie perfectly still, sediment will collect upon them and the consequences are that they smother. The gentle puffs of wind cause the branches to wave and the eggs rock gently back and forth in the water washing from them all sediment.

I was not, however, as successful in this method as my brothers, for I found that the eggs were apt to loosen from the branches and drop to the bottom of the pond.

I then took some trout hatching trays, placed the eggs upon them and floated them loosely over the pond, the eggs by this method hatched to perfection, and my pond was literally alive with young perch. Unfortunately this pond was located at the lower end of a series of three pools being nearly constructed. The leakage was very great, necessitating a large inflow of water. The fish newly hatched being so small and weak and the current through the water so strong that thousands were undoubtedly washed through the leaky places. I would recommend and very strongly that the ponds be reconstructed so that they will be perfectly water tight, so that during the sac period of the fish, it will not be necessary to flow more

water into the pool, than merely enough to make up for the loss by evaporation.

To demonstrate the necessity of having these arrangements in so secure a manner, I would state that the screens used to hold the yellow perch from the outlet are finest brass wire cloth netting made. The meshes being 100 to the inch. Any mesh larger than that would allow the fish to escape. As I am well aware that we will not have the time to correct this evil, during the coming season I have made a large lot of floating boxes, in which I intend to hold the fish until they are about six weeks old when they will be from one-half to three-fourth of an inch in length, a size at which they will be able to stem the current in the pond.

Another experiment I made was in the matter of trough culture. I hatched the eggs and reared the perch similiar to the methods used in brook trout work. The only difference is in the character of the water supply. For perch it is absolutely necessary to use creek or pond water. Spring water seems to be fatal.

I found the sac period on the perch to be from five to seven days. When I noticed they were seeking for food, my first attempt at supplying them was with milk curd which I found I could separate in smaller particles than I could liver. It was a question in my mind for quite some time, whether the little perch were feeding or not, as they were so small, I could not detect anything in their stomachs. It is noteworthy that the young perch are so nearly transparent that for many weeks it is possible with the naked eye to see the entire stomach and intestines.

After a period of eight or ten days by examining a number of the fish with a magnifying glass, I found their little stomachs full of food. From that period on I began to feed ground liver. As this experiment was on a limited scale, I was able to note particularly whether there was any cannibalism among the advanced fry and fingerlings. Up to October the time of distribution I had not discovered that they were feeding upon one another, although it is a well known fact that the parents will feed on the young.

In view of the many waters throughout the State, which are sufficiently warm to be inhabited by yellow perch, this fish is bound to become a valuable factor in fish cultural work. In order to propagate the yellow perch in large numbers and bring them to fingerling stage will require a great deal of space and the use of the battery.

I will kindly call your attention to the matter of the propagation of catfish at this hatchery. It is a fish, the propagation of which will be of great value to your administration. I would suggest that you allow me to construct at least one pond for that purpose this coming spring. I have already secured a number of breeding fish in anticipation of your concurrence.

During the time the employes at the hatchery were not devoted to fish cultural work, they were kept busy at construction work. With the assistance of some temporary employes there was constructed a trunk line for the purpose of supplying the different series of pools with water. This trunk line or sluice is five hundred feet long, twenty-four inches wide and twelve inches deep, furnishing an ample supply of water for all work. In addition to this, for a distance of 250 feet to support this trunking, a stone wall has been laid with an average height of four feet. From its terminus there

extends a four inch iron pipe line, 150 feet in length for the purpose of conducting water to the hatching house fry pools. Four fry pools each forty feet long and eight feet wide with boarded end and natural graveled sides and with a depth of three feet were built. Also one pool 160 feet long by 50 feet wide, an average depth of four feet for the retention of Oswego or large mouth black bass. Besides there was built a stone wall 200 feet long with an average height of four feet on the west side of the Lackawaxen to protect the hatching house and ponds from high water. Also a series of brook trout nursery troughs numbering 32, length 16 feet, width 22 inches, height 10 inches, made out of two inch plank were constructed, together five brook trout fry pools and one pool for adult trout, the dimensions of which is embodied in my report on brook trout. A battery 300 jar capacity, was placed in the hatching house. The superintendent's dwelling house was remodelled and given two coats of paint on the out side and the interior papered and painted throughout. A steam heating plant was installed, and other comforts provided.

I wish to speak here of the excellent service my assistants, J. C. Granville and F. P. Deming, have rendered the Department. Both of them have given their untiring attention to the work at all times. As both of these men were entirely new to the service when I took charge of the Wayne hatchery, they cannot be given too much credit for the advance they have made in fish cultural knowledge. I was very much pleased this past winter on account of their skill in helping me to gather the brook trout eggs. Mr. Granville took charge of the collection of the eggs at Weisport and Mr. Deming the same at Allentown. Both of them have developed into good spawn takers. In speaking in praise of the young men, it should be borne in mind that the duties of fish culturists are very heavy at times, often necessitating very long hours and exposure to all kinds of weather.

In reviewing the work and the conditions existing at the Wayne hatchery, you as well as myself recognize that everything is still in a very crude state and will require time and money to bring it to the point where we wish it. All these ponds will require thorough tightening, and to be right in line and in standing with the other hatcheries, every pond should be lined throughout in order to prevent the great seepage of water. It also will need an immense amount of grading to put the place in order and I would suggest to you that this coming season, we be allowed to devote part of our time to this work.

Respectfully submitted,
NATHAN R. BULLER,
Superintendent.

WAYNE HATCHERY.

Rock Bass Distributed from December 1, 1904, to December 1, 1905.

Lycoming county, fingerlings No. 1,	4,000
Wayne county, fingerlings No. 1,	1,000
Susquehanna county, fingerlings No. 1,	1,000
Total,	6,000

WAYNE HATCHERY.

Yellow Perch Distributed from December 1, 1904, to December 1, 1905.

Wayne county, Fry,	100,000
Philadelphia county, Two years old,	200
Lehigh county, Two years old,	600
Total,	100,800

Cut Throat Trout Distributed from December 1, 1904, to December 1, 1905.

Lackawanna county, Fingerlings No. 1,	25,000
Susquehanna county, Fingerlings No. 1, ..	25,000
Wayne county, Fingerlings No. 1,	20,000
Total,	70,000

Pickerel Distributed from December 1, 1904, to December 1, 1905.

Monroe county, Fry,	500,000
Luzerne county, Fry,	350,000
Susquehanna county, Fry,	2,500,000
Carbon county, Fry,	550,000
Wayne county, Fry,	2,750,000
Pike County, Fry,	800,000
Lackawanna county, Fry,	2,750,000
Total,	10,200,000
Total Distribution of Fingerlings No. 2,	600
Grand total,	10,200,600

Frogs Distributed from December 1, 1904, to December 1, 1905.

Dauphin county,	600
Lancaster county,	300
Cumberland county,	600
Lawrence county,	600
Venango county,	300
Crawford county,	600
Adams county,	300
Huntingdon county,	1,500
Schuylkill county,	7,500
Berks county,	5,100
Luzerne county,	900
Wyoming county,	300
Pike county,	300
Montgomery county,	600
Clinton county,	3,000
Lebanon county,	1,800
Lehigh county,	900
Centre county,	3,300
Perry county,	3,000
Clearfield county,	300
Chester county,	900
Elk county,	3,600
Carbon county,	900
Northampton county,	2,100
Juniata county,	3,000
Lackawanna county,	2,700
Philadelphia county,	3,000
Lycoming county,	1,200
Susquehanna county,	1,500
Columbia county,	2,100
York county,	8,100
Total,	60,900

Brook Trout Distributed from December 1, 1904, to December 1, 1905.

Lehigh county,	33,000
Columbia county,	84,000
Northumberland county,	22,500
Schuylkill county,	133,500
Wayne county,	129,500
Erie county,	125,000
Centre County,	125,000
Monroe county,	190,500
Wyoming county,	13,500
Sullivan county,	30,000
Philadelphia county,	31,500
Luzerne county,	198,000
Union county,	22,500
Carbon county,	156,000
Lackawanna county,	137,000

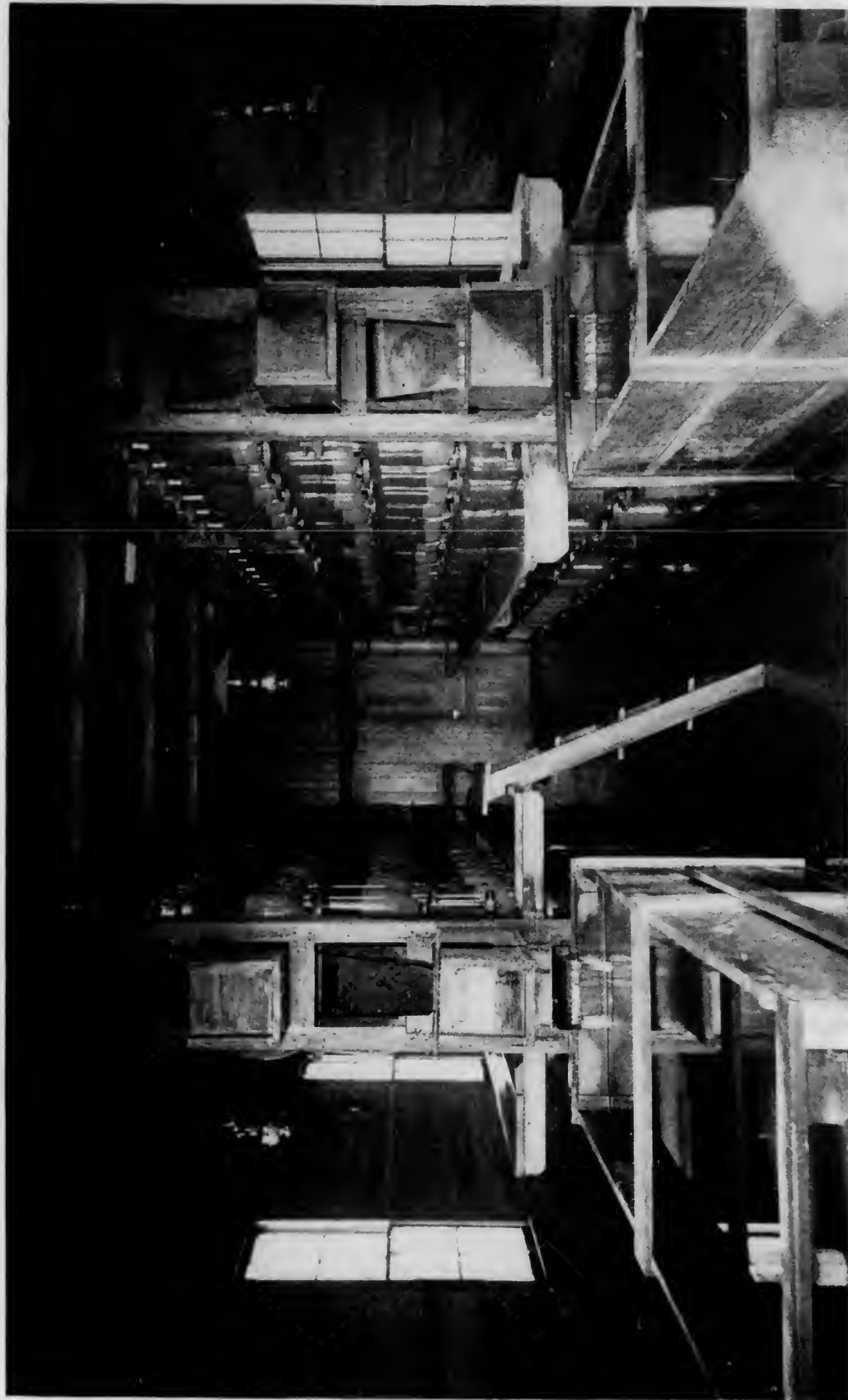
Susquehanna county,	69,000
Pike county,	70,500
Northampton county,	84,000
Total,	<u>1,655,000</u>

The above are to be divided as follows:

Advanced Fry,	210,000
Fingerling No. 1,	1,445,000

To Corry Hatchery.

Brook Trout Eyed Eggs,	400,000
------------------------------	---------



Torresdale Hatchery. Hatching House Interior Showing McDonald and Downing Jars.

TORRESDALE HATCHERY, STATION No. 5.

Report of J. F. Brower, Assistant in Charge.

To Hon. W. E. Meehan, Commissioner of Fisheries:

Dear Sir: I beg leave to make the following report of work done at the Torresdale Hatchery from January 1 to October 1, 1905.

During the early days of the year I could not make the headway with the work that we would like to have done on account of the cold weather. In fact there was nothing that I and assistant could do except to clear out the underbrush, poison ivy and oak at the lower side of the upper pond, so we devoted ourselves to that work.

After a time we could begin to see the light through the wilderness of brush. Then the trimming of the trees and dragging the refuse to a point where it could be destroyed took time and labor. The hardest task was to cut the Osage orange hedge to the ground. It was from twenty to twenty-five feet high with heavy trunks and wide spreading branches.

I built a rustic bridge between the upper and lower ponds, and by the time spring arrived we were ready for the work on the ponds and to build a floating slip at which to land the boats. At last the ground was fit for the plow and scoop, putting on two men we started to finish the pond for gold fish, after finishing roughly the banks and connecting the tank at the overflow with a four foot pipe to convey the water to the pond, we started the pump. Then our troubles commenced. First a small hole with a little stream of water around the four inch pipe, next a portion of the bank gave way, but that was soon repaired and the water filled the pond. As it crawled up the banks more trouble appeared. We found the field mice had used the banks for their winter home, tunnelling from end to end and side to side, and as the water reached these holes on the inside would follow the run and show on the outside. Then the trouble was to find the inlet to plug the holes with clay. Some of the inlets and outlets were twenty feet apart, which caused much trouble to find, but at last we conquered.

While this work was going on Mr. Shannon was sending us gold and silver fish from Frankford, which had to be taken care of. The first lot of 500 was placed in lower pond, balance of 800 were put in large casks and sunk in the water and kept that way until their pond was finished, then we transferred them to their permanent home.

While we were doing the outside work the carpenters were putting in the new battery for the Downing jars, which, when finished, gave us in the old and new battery, 504 jars.

Time had now almost arrived for the shad to ascend the river and the work to receive them began. Mr. Wisner, from the U. S. Department, arrived and had a look at the place. All was moving along smoothly when we had the break in the six inch suction pipe in the

TORRESDALE HATCHERY, STATION No. 5.

Report of J. F. Brower, Assistant in Charge.

To Hon. W. E. Meehan, Commissioner of Fisheries:

Dear Sir: I beg leave to make the following report of work done at the Torresdale Hatchery from January 1 to October 1, 1905.

During the early days of the year I could not make the headway with the work that we would like to have done on account of the cold weather. In fact there was nothing that I and assistant could do except to clear out the underbrush, poison ivy and oak at the lower side of the upper pond, so we devoted ourselves to that work.

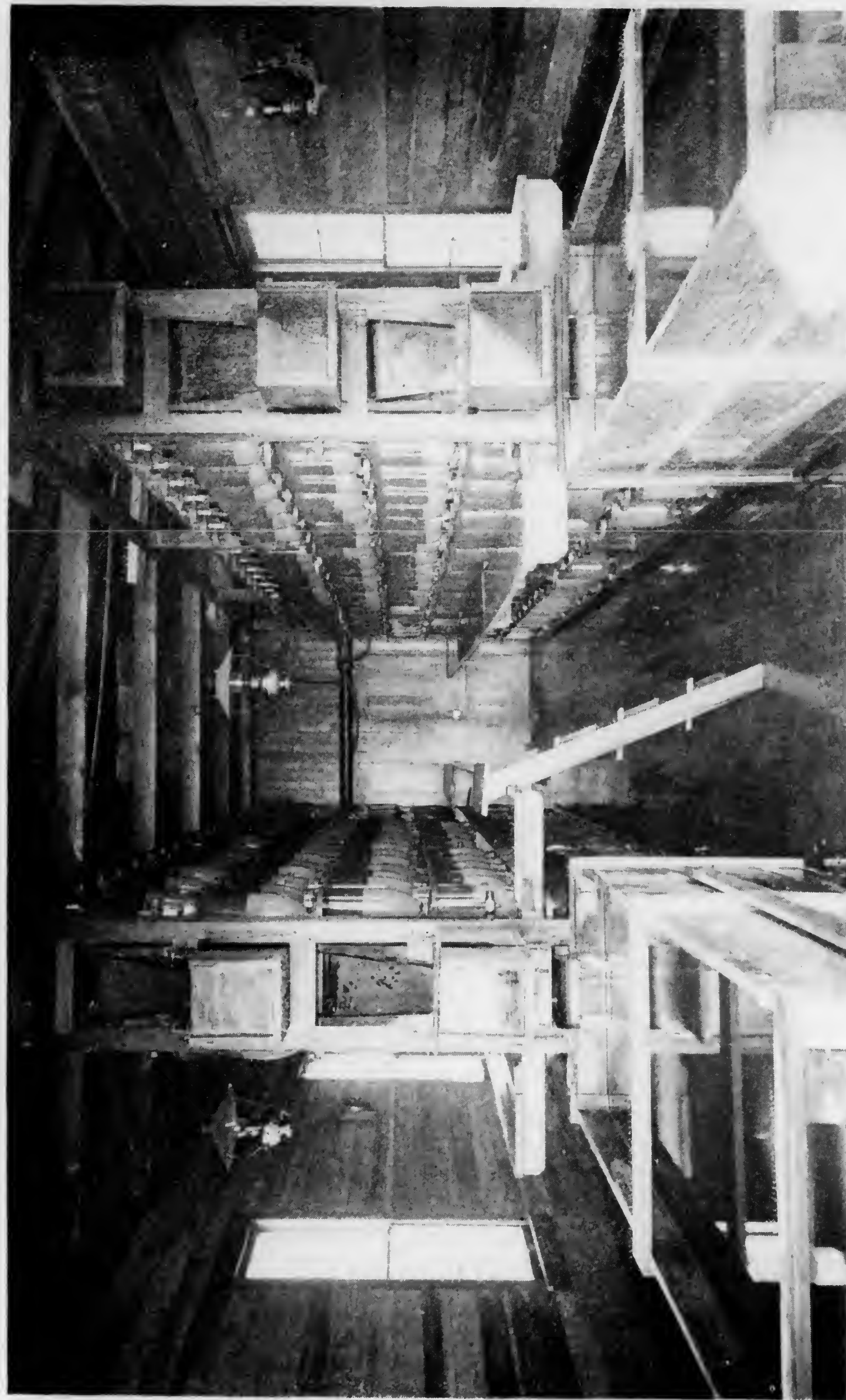
After a time we could begin to see the light through the wilderness of brush. Then the trimming of the trees and dragging the refuse to a point where it could be destroyed took time and labor. The hardest task was to cut the Osage orange hedge to the ground. It was from twenty to twenty-five feet high with heavy trunks and wide spreading branches.

I built a rustic bridge between the upper and lower ponds, and by the time spring arrived we were ready for the work on the ponds and to build a floating slip at which to land the boats. At last the ground was fit for the plow and scoop, putting on two men we started to finish the pond for gold fish, after finishing roughly the banks and connecting the tank at the overflow with a four foot pipe to convey the water to the pond, we started the pump. Then our troubles commenced. First a small hole with a little stream of water around the four inch pipe, next a portion of the bank gave way, but that was soon repaired and the water filled the pond. As it crawled up the banks more trouble appeared. We found the field mice had used the banks for their winter home, tunnelling from end to end and side to side, and as the water reached these holes on the inside would follow the run and show on the outside. Then the trouble was to find the inlet to plug the holes with clay. Some of the inlets and outlets were twenty feet apart, which caused much trouble to find, but at last we conquered.

While this work was going on Mr. Shannon was sending us gold and silver fish from Frankford, which had to be taken care of. The first lot of 500 was placed in lower pond, balance of 800 were put in large casks and sunk in the water and kept that way until their pond was finished, then we transferred them to their permanent home.

While we were doing the outside work the carpenters were putting in the new battery for the Downing jars, which, when finished, gave us in the old and new battery, 504 jars.

Time had now almost arrived for the shad to ascend the river and the work to receive them began. Mr. Wisner, from the U. S. Department, arrived and had a look at the place. All was moving along smoothly when we had the break in the six inch suction pipe in the



Torresdale Hatchery. Hatchling House Interior Showing McDonald and Downing Jars.

river five hundred and twenty-five feet from the pump, but by this time we had become used to these little things.

Early in May Mr. Glennen and sixteen men from the U. S. Hatchery arrived, after pitching their tents, the work of shad hatching commenced. Among this party of U. S. men, eight were sent to collect the spawn and the balance to do other work. We had turned the hatchery over to them; we attended to other work. Put in sluice at lower pond, built dam at cave, started a new pond for catfish. While we were at this latter work we found a stream of water, and the upper or gold fish pond leaking. Finding it was caused by a vein of gravel extending from pond to pond, we rushed the work at the catfish pond so as to end that trouble.

But trouble never comes alone, as on the afternoon of May 31st Mr. Glennen informed me that at 5 P. M. he and his men would leave and turn everything over to me; which meant stop all other work and take charge of hatching shad. This we carried on until the end of the season and I think we were as successful relatively as those who had gone before, considering our small number and the lateness of the season.

After the young shad were all transferred to Mr. Sutton, the New Jersey representative, we resumed work around the hatchery finishing catfish pond, transferred the gold fish to new pond and drained their pond to find the leak. We encountered a lot of trouble; we bored the gravel vein and puddled it with clay which was furnished through the kindness of Mr. Bender, superintendent of filter plant. The clay, after many vexations, held. We again transferred the gold fish to their pond. Then the new pond showed us the same trouble, which must be fixed.

But time was pushing us and we had to look out for our wall to keep the tides from washing out our banks, so we started a stone wall on the river front extending from the upper side of the catfish pond to the old stable, filling in and backing it with soil and making a road to new house and stable.

I should note the theft of our big boat, the thieves leaving in its place a launch, afterwards claimed by Captain Adams of the Schooner Bimiller, and turned over to his representative, also the work done in helping the fish wardens in breaking up illegal fishing on the river.

Thanking you for the many favors and kindness shown to me, I can assure you it is with many regrets I leave the Torresdale Hatchery and your employ.

There has been received at the hatchery the following mature fish and No. 1 Fingerlings:

Gold and silver carp from Mr. Shannon, 1,300 mature.

Gold and silver carp from Mr. Chamberlain, 1,500 No. 1 Fingerling.

Catfish from Mr. J. Sundemeyer, 482 mature.

White perch from Mr. J. Sundemeyer, 39 mature.

Yellow perch from Mr. J. Sundemeyer, 92 mature.

Black bass from Mr. J. Sundemeyer, 10 mature.

Calico bass from Mr. J. Sundemeyer, 2 mature.

Sunfish from Mr. J. Sundemeyer, 96 mature.

Yellow perch from Wayne hatchery, 40 mature.

Torresdale Hatchery. Catfish Ponds and Nursery Troughs.



river five hundred and twenty-five feet from the pump, but by this time we had become used to these little things.

Early in May Mr. Glennen and sixteen men from the U. S. Hatchery arrived, after pitching their tents, the work of shad hatching commenced. Among this party of U. S. men, eight were sent to collect the spawn and the balance to do other work. We had turned the hatchery over to them; we attended to other work. Put in sluice at lower pond, built dam at cave, started a new pond for catfish. While we were at this latter work we found a stream of water, and the upper or gold fish pond leaking. Finding it was caused by a vein of gravel extending from pond to pond, we rushed the work at the catfish pond so as to end that trouble.

But trouble never comes alone, as on the afternoon of May 31st Mr. Glennen informed me that at 5 P. M. he and his men would leave and turn everything over to me, which meant stop all other work and take charge of hatching shad. This we carried on until the end of the season and I think we were as successful relatively as those who had gone before, considering our small number and the lateness of the season.

After the young shad were all transferred to Mr. Sutton, the New Jersey representative, we resumed work around the hatchery finishing catfish pond, transferred the gold fish to new pond and drained their pond to find the leak. We encountered a lot of trouble; we bored the gravel vein and puddled it with clay which was furnished through the kindness of Mr. Bender, superintendent of filter plant. The clay, after many vexations, held. We again transferred the gold fish to their pond. Then the new pond showed us the same trouble, which must be fixed.

But time was pushing us and we had to look out for our wall to keep the tides from washing out our banks, so we started a stone wall on the river front extending from the upper side of the catfish pond to the old stable, filling in and backing it with soil and making a road to new house and stable.

I should note the theft of our big boat, the thieves leaving in its place a launch, afterwards claimed by Captain Adams of the Schooner Bimiller, and turned over to his representative, also the work done in helping the fish wardens in breaking up illegal fishing on the river.

Thanking you for the many favors and kindness shown to me, I can assure you it is with many regrets I leave the Torresdale Hatchery and your employ.

There has been received at the hatchery the following mature fish and No. 1 Fingerlings:

Gold and silver carp from Mr. Shannon, 1,300 mature.

Gold and silver carp from Mr. Chamberlain, 1,500 No. 1 Fingerling.

Catfish from Mr. J. Sundemeyer, 482 mature.

White perch from Mr. J. Sundemeyer, 39 mature.

Yellow perch from Mr. J. Sundemeyer, 92 mature.

Black bass from Mr. J. Sundemeyer, 10 mature.

Calico bass from Mr. J. Sundemeyer, 2 mature.

Sunfish from Mr. J. Sundemeyer, 96 mature.

Yellow perch from Wayne hatchery, 40 mature.

Torresdale Hatchery. Catfish Ponds and Nursery Troughs.



There has been hatched and placed in the Delaware river shad fry by the United States 3,256,000.

Shad fry by Pennsylvania,	554,000	
Alewife's,	2,754	
White perch,	2,125,000	5,937,754

Delivered fish per orders:

Mr. Vandergrift, Andalusia, Bucks county,	75 mature sunfish.
Mr. A. Fittswater, Phoenixville, Chester county,	200 No. 1 fingerling sunfish.
Mr. Charles Reimer, Phoenixville, Chester county,	200 No. 1 fingerling sunfish.
Mr. Thomas Capp, Lebanon, Lebanon county,	200 No. 1 mature catfish.
Mr. Grant Weidman, Lebanon, Lebanon county,	25 No. 1 mature catfish.
Mr. E. K. McConkey, York, York county,	200 No. 1 fingerling sunfish.
Mr. M. A. Hayson, Bridgeton, York county,	25 No. 1 mature catfish.
Mr. M. A. Hayson, Bridgeton, York county,	200 No. 1 fingerling sunfish.
Atherton & Barnes, Phillipsburg, Clearfield county,	200 No. 1 fingerling catfish.
E. M. Thomas, Torresdale, Philadelphia county,	2,100 No. 1 fingerling catfish.
Curtin School, Germantown, Philadelphia county,	115 mix gold fish.
	3,540

Yours truly,

J. F. BROWER,
Assistant in Charge.

September 29, 1905.

TORRESDALE FISH HATCHERY, STATION No. 5.

Report of Superintendent W. H. Safford.

Hon. W. E. Meehan, Commissioner of Fisheries:

Dear Sir: I herewith beg to submit the following as my report on the operations of Torresdale Station since my appointment to be its superintendent on October 1, 1905.

Owing to the fact of the much needed repairs then in course of progress, the station was in practically a dismantled condition. It therefore took some little time to place the station on a satisfactory working basis again. There has been completed the superintendent's residence, a modern building in every detail, a gift to the Department from the City of Philadelphia, and a fine stable for horse and equipment has also been finished. An addition to the hatchery in the shape of a boiler room or pump house has added materially to the efficiency of the station. The hatchery building proper including living rooms upstairs, have been receiled, adding not only to warmth of building, but greatly to its appearance. Both superintendent's residence and hatchery building have been very nicely painted with the Department colors—white and green.

Since taking the station the entire equipment was given a general overhauling. The Torresdale Station depending as it does entirely on a pumping system for its water supply for the hatchery and portion of ponds, it became necessary to buy a new steam pump as the one in use had been in service quite a number of years and had become nearly worn out. Proposals for new pump were asked for from different manufacturers. The one selected was known as the Burnham single stroke steam pump with a capacity of 455 gallons per minute, which so far has proven very satisfactory.

The old steam pump on the installation of the new one, was at once sent to the shop to be generally overhauled and repaired. When returned to the station it was set up to be used as an auxiliary. In placing the hatchery in condition, preparatory to receiving eggs, it was discovered that something was wrong with the large intake main, for with the new pump coupled to the main we were unable to get water in sufficient quantity to feed the batteries. After trying to locate the trouble in various ways and being unable to do so, it was decided to take up the intake main. This was done at a considerable expense and trouble as besides being six inch iron pipe in fifteen feet lengths, it was in some places covered by eighteen inches of soft mud. I finally succeeded in getting main out and discovered three full lengths, or forty-five feet, nearly two-thirds full of mud, making it utterly impossible to get sufficient supply of water. After cleaning thoroughly, I re-coupled main and from that time on we have had a fine supply of water.

On December 6th there was received at this station 5,832,000 white fish eggs, and on December 11th we received 34,660,000 lake herring eggs. The batteries being ready to receive them the jars

Torresdale Hatchery. Yellow and White Perch Pond From the Breast.



TORRESDALE FISH HATCHERY, STATION No. 5.

Report of Superintendent W. H. Safford.

Hon. W. E. Meehan, Commissioner of Fisheries:

Dear Sir: I herewith beg to submit the following as my report on the operations of Torresdale Station since my appointment to be its superintendent on October 1, 1905.

Owing to the fact of the much needed repairs then in course of progress, the station was in practically a dismantled condition. It therefore took some little time to place the station on a satisfactory working basis again. There has been completed the superintendent's residence, a modern building in every detail, a gift to the Department from the City of Philadelphia, and a fine stable for horse and equipment has also been finished. An addition to the hatchery in the shape of a boiler room or pump house has added materially to the efficiency of the station. The hatchery building proper including living rooms upstairs, have been receiled, adding not only to warmth of building, but greatly to its appearance. Both superintendent's residence and hatchery building have been very nicely painted with the Department colors—white and green.

Since taking the station the entire equipment was given a general overhauling. The Torresdale Station depending as it does entirely on a pumping system for its water supply for the hatchery and portion of ponds, it became necessary to buy a new steam pump as the one in use had been in service quite a number of years and had become nearly worn out. Proposals for new pump were asked for from different manufacturers. The one selected was known as the Burnham single stroke steam pump with a capacity of 455 gallons per minute, which so far has proven very satisfactory.

The old steam pump on the installation of the new one, was at once sent to the shop to be generally overhauled and repaired. When returned to the station it was set up to be used as an auxiliary. In placing the hatchery in condition, preparatory to receiving eggs, it was discovered that something was wrong with the large intake main, for with the new pump coupled to the main we were unable to get water in sufficient quantity to feed the batteries. After trying to locate the trouble in various ways and being unable to do so, it was decided to take up the intake main. This was done at a considerable expense and trouble as besides being six inch iron pipe in fifteen feet lengths, it was in some places covered by eighteen inches of soft mud. I finally succeeded in getting main out and discovered three full lengths, or forty-five feet, nearly two-thirds full of mud, making it utterly impossible to get sufficient supply of water. After cleaning thoroughly, I re-coupled main and from that time on we have had a fine supply of water.

On December 6th there was received at this station 5,832,000 white fish eggs, and on December 11th we received 34,660,000 lake herring eggs. The batteries being ready to receive them the jars



Torresdale Hatchery. Yellow and White Perch Pond From the Breast.

were filled and started. The eggs are in process of incubation and doing fairly well at this date. As the season was well advanced before my arrival at the station, the limit of time for outside work was short. The main driveway running around lower end of pond two, between hatchery and superintendent's residence was graded and raised to a height of about three feet bringing it to a level with lawn at hatchery and residence. These lawns are kept nicely cut and trimmed. Considerable grading was done around superintendent's residence, a terrace extending some distance front was also completed. The ground on south side of hatchery was filled in to a level with rest of lawn at that point.

The catfish pond being only partially completed, I proceeded to reconstruct it taking out about eighteen inches of bottom of upper end of pond to conform with the kettle. One fry pond was started and partially completed.

As the station is new the fish cultural duties, aside from those in the hatchery, are light, and the station has not nearly reached its full capacity for work. There is at present in the ponds a very good start in the following species: yellow perch, sunfish, black bass, and catfish, both white and yellow.

In the gold fish pond there is a fine set of brood fish, although last year, owing to being placed in a newly constructed pond and handled frequently, their spawning qualities were greatly interfered with. The gold fish being propagated for the public schools of the Commonwealth, the demand at this station was very heavy. The supply this year not being equal to the number of applicants on file. Mr. Andrew J. Malin, of Phoenixville, and W. B. Chamberlain, of Torresdale, very generously gave their surplus fingerlings to the Department; Mr. Chamberlain giving about three thousand. These together with what were in the ponds enabled me to supply the following schools of Philadelphia with gold fish:

Special School No. 7, Wm. McKinley, The Logan, George Brooke, The Webster, J. Sylvester Ramsey, John Hancock, Wyoming, Warner, George M. Wharton, Beck's Primary, James Campbell, Calhoun Combined, Newton for Girls, Paschalville Combined, Fairhill, Northwest, Isaac A. Shepard, Edward Shippen, Rutledge Combined, Commercial for Girls, Thomas B. Florence, Chestnut Hill, C. W. Shafer, F. D. Pastorius, Joseph E. Hill, Levering Consolidated, Andrew G. Curtin, Joseph Leidy, Daniel Keyser, Belview, Alfred C. Harmer and the Board of Education. This branch of the fish cultural work by the Department is one of the most worthy in many ways, affording a very interesting study to the pupils of the public schools of the Commonwealth.

One shipment of yellow perch and black bass was made to Bucks county and one shipment of sunfish to Montgomery county. The fact that a power launch being at this station for its use in various capacities made it very necessary that we should have an anchorage close in shore, not only to protect boat but also to be more convenient in using. A channel was ordered cut by the Commissioner, leading from shore to deep water, which is partly completed. The labor was furnished by the Hon. Sheldon Potter, Director of Public Safety, of the city of Philadelphia. This will be entirely finished on the opening of spring. The cost of labor on this channel being brought to a minimum through the kindness of the Director of Public Safety. The launch itself will need a general overhauling

both in hull and engine in order that it may be put in first class condition. The location of the station, being as it is close to the large city of Philadelphia the number of visitors is very large, probably being in excess of any other in the Department, there being from five to one hundred per day, many showing great interest in the work done. The future of the Torresdale Station, in my opinion, is very bright. It is one of the very few shad stations in the United States, making it very important in that one feature alone. Prospects of propagation of the yellow perch, black bass, sunfish and cat-fish are excellent. All of which is respectfully submitted.

Your obedient servant,

W. H. SAFFORD.

TORRESDALE HATCHERY, STATION No. 5.

Output of Gold Fish for 1905.

	Section.	No. of fish.
Beck's Primary School,	3	45
Belview School,	28	100
Board of Education,	34	40
Brooks, George,	34	85
Baldwin, Mathias,	26	140
Curtin, Andrew G.,	22	70
Calhoun Combined,	39	15
Commercial High for Girls,	22	*25
Chestnut Hill Primary,	22	15
Campbell, James,	4	75
Fairhill,	33	95
Florence, Thomas B.,	3	65
Girard, Stephen,	36	75
Hancock, John,	14	70
Hill, Joseph E.,	22	5
Harmer, Alfred C.,	22	30
Keyser, Daniel L.,	22	40
Leidy, Joseph,	24	65
Logan Higher Primary,	42	20
Levering Consolidated,	21	75
McKinley, William,	19	85
Newton for Girls,	27	25
Northwest School,	10	100
Pastorius, F. D.,	22	60
Paschalville Combined,	40	15
Ramsey, J. Sylvester,	7	35
Rutledge Combined,	20	25
Schaeffer, C. W.,	22	50
Shippin, Edward,	10	25
Sheppard, Isaac A.,	33	110
Special No. 7 (Ludlow below 36th),	5	20
Wharton, Geo. M.,	2	75
Wharton Combined,	17	50
Webster,	13	65
Wyoming,	13	105
Warner,	13	30
Total,		2,025

*Adult fish.

UNION CITY AUXILIARY HATCHERY, STATION No. 6.

Report of A. G. Buller, Superintendent,

To the Members of the Board of Fishery Commission:

Gentlemen: After the bill for the auxiliary hatchery had been passed and signed by the Governor, Hon. Samuel W. Pennypacker, Mr. Meehan directed me to look up a suitable site on which to locate the station. Among the numerous places visited I found several which were admirably adapted to the work. According to the Act authorizing the hatchery, it was necessary that citizens of Erie county should present the State with at least fifteen acres of land before the appropriation to build could become available.

Citizens of Girard and Union City were especially anxious to secure the new hatchery and offered better inducements as to location and other needs. The location and supply of water one place was indeed about as favorable as the other. But Union City offered the larger number of acres and some other advantages, and Mr. Meehan after carefully considering all points finally decided in favor of Union City. About thirty acres of land were donated, of which we have in our possession at the end of the calendar year the deeds for twenty-four. The deed for the remaining number of acres is now being passed around to the different heirs who are scattered in various parts of the country to be signed.

There is an ample stream of spring water passing through the entire length of the property which can be used for pond work. There are also a number of small springs on the land, which will be of special benefit for the work, and several others outside from which permission has been given to draw.

The dwelling house and barn which stood on part of the grounds and owned by Mr. Garrett Smith, was purchased by Mr. Meehan to be used as a dwelling for the superintendent, and the barn for housing the cattle. The property is conveniently located about one mile and a quarter from the depot, and the dwelling house has two and one half stories with nine rooms and with all modern conveniences, also has a summer shed attached. The dwelling was in good repair and needed nothing but repapering. There is also a very pretty lawn around the house, bordered with a row of large maple trees facing the public road between Union City and Corry which is frequently traveled.

I took possession of the dwelling house on September 5th. On the 21st day of September the foundation for the hatching house was staked off in the presence of Mr. Meehan and Mr. Whitaker. The size of the building is forty feet by one hundred feet, ten feet to square. It is well lighted, having forty-eight windows with single glass lights. The floor is concrete. The building is frame with tile foundations. The interior arrangements of the hatching troughs differ radically from those in the other hatcheries in the State. Ordinarily a house of the above dimensions would hold only eighty troughs, but in this there are 120. The supply trough, as in other



Union City Auxiliary. Interior Hatching House Showing Three Tiers of Hatching Troughs. New System.

UNION CITY AUXILIARY HATCHERY, STATION No. 6.

Report of A. G. Buller, Superintendent,

To the Members of the Board of Fishery Commission:

Gentlemen: After the bill for the auxiliary hatchery had been passed and signed by the Governor, Hon. Samuel W. Pennypacker, Mr. Meehan directed me to look up a suitable site on which to locate the station. Among the numerous places visited I found several which were admirably adapted to the work. According to the Act authorizing the hatchery, it was necessary that citizens of Erie county should present the State with at least fifteen acres of land before the appropriation to build could become available.

Citizens of Girard and Union City were especially anxious to secure the new hatchery and offered better inducements as to location and other needs. The location and supply of water one place was indeed about as favorable as the other. But Union City offered the larger number of acres and some other advantages, and Mr. Meehan after carefully considering all points finally decided in favor of Union City. About thirty acres of land were donated, of which we have in our possession at the end of the calendar year the deeds for twenty-four. The deed for the remaining number of acres is now being passed around to the different heirs who are scattered in various parts of the country to be signed.

There is an ample stream of spring water passing through the entire length of the property which can be used for pond work. There are also a number of small springs on the land, which will be of special benefit for the work, and several others outside from which permission has been given to draw.

The dwelling house and barn which stood on part of the grounds and owned by Mr. Garrett Smith, was purchased by Mr. Meehan to be used as a dwelling for the superintendent, and the barn for housing the cattle. The property is conveniently located about one mile and a quarter from the depot, and the dwelling house has two and one half stories with nine rooms and with all modern conveniences, also has a summer shed attached. The dwelling was in good repair and needed nothing but repapering. There is also a very pretty lawn around the house, bordered with a row of large maple trees facing the public road between Union City and Corry which is frequently traveled.

I took possession of the dwelling house on September 5th. On the 21st day of September the foundation for the hatching house was staked off in the presence of Mr. Meehan and Mr. Whitaker. The size of the building is forty feet by one hundred feet, ten feet to square. It is well lighted, having forty-eight windows with single glass lights. The floor is concrete. The building is frame with tile foundations. The interior arrangements of the hatching troughs differ radically from those in the other hatcheries in the State. Ordinarily a house of the above dimensions would hold only eighty troughs, but in this there are 120. The supply trough, as in other



Union City Auxiliary. Interior Hatching House Showing Three Tiers of Hatching Troughs. New System.

hatching houses, runs the full length of the building on the east side and below it are three tiers of troughs, the water from one running into the others below. The first tier is fed from the supply trough; the second tier set eight inches lower than the first. The lower end of each tier of troughs extend over the upper ends of the tier below so that the water from the first tier falls into the second tier and then into the third. The third tier of troughs has an eighteen inch drop instead of eight inches.

In order to better aerate the water, there will also be a small pan with perforated bottom for the water to pass through before it reaches the third tier. In this way a large amount of fish can be carried with one-third the amount of water which an ordinary hatchery would require.

The water supply for the hatching house is received from the Bentley spring and the Shepard pond about 100 feet away, the use of which have been legally given. My intention was to lay pipe from the Bentley spring to the hatching house this winter, but owing to the cold weather we were unable to entirely complete the work. The pipe line from the Shepard pond is completed and in operation. The flow of water from this pond is 100 gallons per minute, nearly enough for the work of the house. It was necessary to get the water from this pond for the hatching house and the necessary legal papers were promptly signed by the owner, Mr. T. J. Sheppard, for merely a nominal consideration, and under the terms of the agreement we raised the pond two feet and put in an intake tank for the small compensation of laying a three-quarter inch pipe from the pond to his barn and a six inch drainage pipe from the barn to the road, a distance of two hundred feet. The pond is a natural pond of spring water.

I also wish to speak of the courtesy of Mr. M. D. Seymour in allowing us to lay the pipe to the hatching house through his land from the Seymour pond.

At the upper end of the property now in our possession was a mill dam badly dilapidated and empty of water. I have begun the construction of a large pond at this place by rebuilding the breast and digging the area of the old pond deeper and wider. When finished it will cover about one acre of ground and it is hoped will make a desirable body for lake trout or muscallonge. An old mill race leading from this pond and passing the hatchery building has also been dug deeper, and in the spring I will board the sides and cover it to keep the water cool and free from surface drainage. The water from the Sheppard pond is naturally, although spring water, subject to considerable variations in temperature excepting in the winter when it registers from 33 to 35 degrees F. For this reason fish eggs will be longer in hatching. But this, as fish culturists are aware, is rather an advantage than otherwise.

Shortly after I began work at Union City, Mr. Meehan instructed me to get the hatching house ready to receive eggs as quickly as possible. On the 22d day of September we began to dig the foundation. The work continued nicely until we reached the depths of three feet when we came upon numerous springs which made the digging very difficult. When the digging was completed we laid drain pipe to carry off the water from these springs. The foundation for the building was ready for the carpenters to begin work on

the 13th day of October, and the house was in readiness to receive eggs on November 28.

I have no knowledge of a hatching house being completed in so short a time.

On November 29 we received our first consignment of eggs which was 900,000 lake trout eggs. We also received 900,000 eggs on the 30th day of November.

I cannot help but feel that this is the beginning of excellent work which can be accomplished at this station.

I wish to mention the kindness and generosity of the people of Union City. All seem to be interested in the work and wish to lend their aid in any way possible to improve or help make this station a grand success.

Respectfully,

A. G. BULLER,
Superintendent.

CARP INDUSTRY IN PENNSYLVANIA FOR 1904.

By George D. Shannon, Fish Warden.

Philadelphia.

To the Board of Fisheries Commission:

Gentlemen: In obedience to an order issued by Mr. W. E. Meehan, Commissioner of Fisheries, I undertook to gather as nearly accurate as possible the amount of German carp sold in Pennsylvania during the year 1904 and the money realized, in order that some idea might be had of the extent of the industry. I was directed to gather statistics in the largest cities and most important towns only. Hence the figures which I have gleaned must necessarily represent much less than the actual size of the industry in Pennsylvania.

From the figures obtainable it appears that in 1904 there were sold 5,214,200 pounds of live and dead carp in the principal cities and towns in Pennsylvania, producing a sum of \$263,945 to the dealers. In gathering these figures I took no account of the fish caught in Lake Erie and sold by the dealers in the city of Erie, because the vast bulk were shipped to cities and towns in Pennsylvania, and would have probably been counted the second time.

The following table gives the cities and towns, the amount of pounds of fish sold and the sum realized therefrom:

Philadelphia,	3,490,000 pounds	\$174,700 00
Pittsburg,	845,000 pounds	29,330 00
Allegheny,	92,000 pounds	920 00
Scranton,	2,000 pounds	120 00
Various other towns,	785,200 pounds	58,875 00
Total,	5,214,200 pounds	\$263,945 00

The traffic in German carp in Philadelphia, where the largest business is done in this species of fish, is conducted chiefly by people of foreign birth or immediately foreign heritage. The trade is almost entirely with the Jews, Italians and Hungarians. It was difficult to secure anything like an approach to an accurate report among a number of the dealers as to their sales during the year, inasmuch as many of the small dealers buy and handle the catch of illegal fishermen and poachers. The latter catch the carp and by arrangements have the dealers meet them at specified points, times and places on the Delaware river and its tributaries. The dealers take a pair of scales and boxes and go to the named points from two to three times a week and buy the catch of the fishermen.

As the German carp is a fish very tenacious of life, it will live several hours out of water, especially in the winter months, so the dealers have no difficulty in carrying them alive from the streams to their place of business. There the fish are placed in tanks of running water which each dealer has in his back yard and then sold to the consumers.

Live carp in Philadelphia bring from 8 to 10 cents a pound more than those which are dead, hence the risk which the fishermen are willing to take in poaching and illegal fishing and buying. Live carp are much more in demand than dead or western stock and sell during the fall and winter months at 12 to 16 and 18 cents a pound. At times, though rarely, the price will range as high as 22 cents. Large carp, from twenty to thirty pounds weight, are not as much sought after as those running from four to eight pounds, and the price of such fish is accordingly less. Heavy weight carp seldom brings more than 7 or 9 cents a pound alive.

The dead carp exposed in the Philadelphia markets come mostly from western rivers. The Illinois river supplies the bulk. They are frozen or packed in ice and bring from two to six cents a pound according to the size, condition and state of the market.

Although there is a large number of small dealers, the bulk of the trade in Philadelphia is practically in the hands of three houses. They purchase direct from the fishermen from points on the Delaware river and tributary streams as far south as Newport, Delaware, and north as far as Trenton, New Jersey, and it is to these houses that I am indebted for the most trustworthy material and from whom I received every courtesy. The fishermen bring the carp in live cars or boxes, the traders being generally towed in by naptha launches. The principal market is on Dock Street, although at times quite a few are brought into Callowhill and Vine Street wharves.

Should any of the small dealers buy direct from the fishermen on the wharves a duty or tax is levied on them by the wholesalers, that is to say a certain per centage is charged the small dealers for use of the scales, etc., for weighing out.

I interviewed all the dealers, large and small, with the exception of one in Chester, in regard to their sales during the past year, and whether, each in their opinion thought the carp were on the increase or decrease. They all made the same reply, namely, that this fish is decidedly on the increase and are in waters to stay. Many thought more fish were caught and handled in the Philadelphia market during the year 1904 than in 1903.

As a result of my investigation the astonishing fact stands clearly forth that the carp industry in the Philadelphia markets ranks next to that of the shad notwithstanding its strong condemnation throughout the State as the fish of inferior food qualities. Its value as a commercial commodity is therefore only next to the shad, which is generally conceded to be the finest commercial food fish taken from the waters of Pennsylvania.

As stated above the total sale of the German carp in the Philadelphia markets during the year 1904 amounted to 3,490,000 pounds. The wholesale selling price averaged from five to six cents a pound for both live and dead fish, only one dealer reporting an average of four cents a pound and only one six cents. The total sum realized \$174,700 is more than one-half the usual estimated annual

value of the shad industry. Of the carp sold during 1904 in Philadelphia 1,969,200 pounds were live fish and 1,520,800 pounds were dead fish or western fish. Hence the former figures represent with some accuracy the number of German carp caught in Pennsylvania waters for the Philadelphia markets, because from my investigations it is in Philadelphia only that live German carp are sold in any great number and in all other parts of the State the dead fish are brought either from the western States or from Lake Erie. The value of the live fish sold in the Philadelphia markets in 1904 was at least \$98,760.

The different dealers not only declare the carp to be on the increase in the waters of Pennsylvania, but they declare most positively that if the State of Pennsylvania would permit additional devices for catching them the industry would be very much greater. They say that the bulk of the dead fish are imported from Illinois and other western points, representing the present shortage of the supply of Pennsylvania fish, and that with additional facilities given by the State to fishermen the latter could easily furnish the more than 1,520,800 pounds from local waters and thus keep a large sum of money in the State.

It is a very interesting sight to go through the Jewish section of the city of Philadelphia. Smoked and green or fresh stock are displayed on stalls or carts at prices ranging from high to low according to the quality of the commodity offered. It is a common sight to see tubs and tanks on the stands containing water and holding live fish (carp and suckers). Many of the Jewish faith will not eat fish which are exposed dead for sale, but must see the fish alive and have them killed or cleaned according to a prescribed form or method.

It frequently happens that a dealer will scale a portion of the carp alive and cut from its writhing body as much as a customer desires and the latter goes home with his purchase, cooks and eats it, while the mutilated carp retained by the dealer flops and gasps on the fishmonger's stall. I talked with the different dealers concerning the handling of live carp and the practice of mutilating them for the convenience of the customer, and many express a feeling that the Legislature should either prohibit the sale of live fish altogether or make it an offense to mutilate a live carp or suckers.

Vast quantities of green or fresh pike, pickerel and bass are sold to the better class of the Jewish trade and it is of little consequence to the dealer from what section they come.

I had naturally expected to find Pittsburg and Allegheny cities not far behind Philadelphia in the size of its carp industry on account of the large foreign population. When I first visited the stalls of the market in Pittsburg my opinion was strengthened because everywhere I saw large piles of fresh dead German carp, but when I had gathered my figures I found the total to be only about 845,000 pounds which realized \$29,330 to the dealers.

I was more than surprised in going through the Diamond market in Pittsburg and in talking to the different dealers, all of whom gave me kind and courteous treatment and every facility for gathering details of the carp business to learn the actual facts. While the industry is not as large in Pittsburg and Allegheny cities as in Philadelphia, it will be seen by the figures that the industry is still an important one, for there are many thousands of pounds sold, realiz-

ing many thousands of dollars. There are seven principal dealers in Pittsburg and three in Allegheny city. The bulk of the fish come from the Illinois river, Sandusky, Ohio, and from Lake Erie, although large numbers are caught in the Allegheny and Monogehela rivers and their tributaries. It is said, however, that since the repeal of Section 9 of the Act of May 29, 1901, which allowed the use of a seine for the capture of carp the number of this species of fish caught in the western rivers in Pennsylvania and sold in the markets of Pittsburg and Allegheny was greatly decreased.

A large portion of the carp handled in the markets of Pittsburg during the summer months are sold to the hucksters and peddlers to the amount of hundreds of barrels a week to be sold in the adjoining towns and suburbs. The largest firm who makes a specialty of catering to the Jewish trade and to the peddlers states that the sale of carp amounts to over \$10,000 a year.

Perhaps it would be as well to say at this point that I made inquiry of the different firms as to whether their sales of German carp were more in 1904 than in 1903, and all declared that the demand and sale were much greater. The fish from the western points are packed in barrels and covered with ice.

Fish Warden Lowery gathered the figures from the anthracite coal regions, and the surprising fact was developed that notwithstanding the supposed preponderance of the foreign element in that section the value of the carp industry was almost nothing. The business was done in Scranton and even there only about 2,000 pounds were reported with a value of \$120. Wilkes-Barre, Carbon-dale and one or two other points in that section scarcely realized more. From other places like Harrisburg, Williamsport, Lock Haven, York and Lancaster, and multitude of places of similar size, the total number of pounds was about 785,200, with a total value of \$58,875. The price per pound in these miscellaneous towns ranged a little higher, apparently about seven and a half cents per pound. It is curious that even the foreign element outside of Philadelphia and Pittsburg and Allegheny cities do not appear to take much interest in the carp or purchase them to any great extent. I found that the native born and English can hardly be induced to use the fish at all. There were exceptions here and there, people who declare that when properly cooked the fish was either good or fairly edible. I found along the Susquehanna a bitter feeling against the carp and an indifference to it either as a food for the fishermen or as an industry. Yet without doubt the waters of the Susquehanna and its tributaries are rich with the fish, which has a high price in the leading markets.

While in Philadelphia I made inquiries of the dealers why it was that the foreign element, notably the Italians, Jews and Huns, were willing to pay such a high price for the flesh of the German carp. They replied that notwithstanding the first cost was high, by the time the people had prepared the fish and it was ready for the table, it was cheaper than meat. After scaling and cleaning the fish and taking therefrom the bones, they mixed the flesh with potatoes, turnips, onions, greens, bread and other very cheap vegetables or food and then cooked the whole and the price thereof was very low.

In dealing directly with the Philadelphia markets I omitted to state that the steamers running from Newport, Leipsic, Smyrna,

Blackbird and other creeks on the State of Delaware side of the river Delaware all carry large tanks on their decks for the sole purpose of handling live carp. The catchers of carp bring their fish from miles up these different streams to the steamboat landing in live cars and then dip them from the said cars into tanks on the steamboat decks. As the dealers in Philadelphia all know of the time of the arrival of the different steamers they have wagons on the wharves to meet them. The fish are so weighed off to the different purchasers and hurried to their places of business and are so put into the tanks which each dealer has in his yard and then keep running water on them until sold. The above will give you as nearly a complete compilation of the carp business as it is possible for me to prepare. I made it a particular point to inquire if any of the fish dealers, especially in the western part of the State, handled or bought carp through one another, but found they purchased that class of fish almost always directly from the packers and shippers in the west.

The foregoing is respectfully submitted.

GEORGE D. SHANNON,
Fish Warden.

NOTES ON GERMAN CARP.

By W. E. Meehan, Commissioner of Fisheries.

The report of Fish Warden George D. Shannon on the carp industry in Pennsylvania for 1904 is likely to call attention again to an industry the advent of which was hailed with much enthusiasm all over the country between the years 1880 and 1886. There is probably no fish either indiginous or introduced which has excited so much interest as the German carp. Few species of fish have been introduced with a greater blare of trumpets or from which so much was expected, and no fish was afterwards so deeply and generally execrated as the German carp. As an illustration of the two extremes Professor Baird, the first Commissioner of the United States Commission, declared in one of his annual reports that the German carp was distinctly to be for the warm water streams and for the poor people, what the brook trout is to the mountain streams and the sportsmen anglers. Recently a newspaper compared the introducer of the German carp to Benedict Arnold.

In only one particular has every promise concerning the German carp been realized, namely, that it is wonderfully prolific and would abound in all the waters in this country. The great mass of the citizens have repudiated the German carp as a fish undesirable for food. Very few people will eat it excepting certain of the foreign element and a class of citizens who purchase it because of its wonderful vitality, which will permit it to be killed according to certain religious observances.

It must be confessed that the popular execration of the German carp is based on strong foundations. Possessing a strong muddy flavored flesh, it is rightfully regarded by good judges as an exceedingly inferior food fish. Of wonderful fecundity it has overrun the streams and been one of the factors towards depleting the waters of better food and game fishes. An inveterate spawn eater, a German carp will clear the nests of the black bass and sunfish of eggs in a few moments and readily strip hundreds of strings of yellow perch eggs from the water plants. Vegetarian also in its habits it digs in the mud for roots of water plants and so destroys the hiding places and sheltering places of the little fish and also deprives them of daphne, clyclops and other water life, which thrives on the before mentioned water plants.

But there is a strong feeling growing among those who recognize and admit the destructive character of the German carp and its undesirability as a food fish have been too outspoken and free in their condemnation. By their too great freedom they have given fish pirates, pot hunters and thousands of people who do not care much for the means by which fish are killed, so that they can kill them, an excuse to join in a demand on the legislature to let down the bars and permit the use of any device whatever for the capture of German carp. In other words it is to be feared that unless there is a sober second thought, the people of the State are in danger of becoming what someone termed "carp mad."

There is no doubt in my mind that every proper effort should be made to reduce the number of German carp now existing in our streams, but any effort made in this direction should be made with a due regard for the protection of other fishes. As shown by the report of Mr. Shannon, a ready market can be found for the fish, and despite the present conditions which limit a means of capture, a very large industry has been built up in the State, especially in the cities of Philadelphia, Pittsburg and Allegheny City. The number of carp in the Delaware within tidewater has been greatly reduced within the last ten years by proper methods of fishing, and the same thing can be done elsewhere. It was comparatively an easy matter a few years ago for the owners of a stake net to capture from a ton to a ton and a half and two tons of carp in a week. To-day 300 to 500 pounds is considered a good week's haul.

The new law enacted at the last session of the legislature permitting the use of a seine having a mesh of four inches stretched measure and on the giving of a bond of \$200 is being taken advantage of by many people in the river in which the German carp are known to be abundant, thus indicating not a special desire to get rid of the German carp but to catch them for profit. I see no reason at present why the sentiment should not be applauded.

According to Mr. Shannon the number of Pennsylvania caught carp decreased materially with the repeal of Section 9, of the Act of May 29, 1901, which permitted two inch mesh seine stretched measure to be used for the capture of the fish. It is to be hoped that the figures will materially increase under the new law.

According to Mr. Shannon's report on the carp sold in the city of Philadelphia during 1904, 1,969,200 pounds were live fish and 1,520,800 pounds were dead western fish, and he is probably correct in his assumption that the former represented with some accuracy the number of carp caught in Pennsylvania for the Philadelphia markets

and that the bulk of 1,520,800 pounds of dead fish came from other States. If this is true and since there is a market for more than a million and a half pounds beyond the home catch, it would seem to be common sense for Pennsylvania fishermen to give more attention to the capture of German carp for commercial purposes. They will probably fare better financially than by fishing for other fish illegally. It will be noticed that the German carp industry is nearly one-half that of the shad, which along with the white fish and lake herring and wall-eyed pike of the lakes are generally regarded as the most valuable of our fishery industries. It is logically followed therefore that the industry should be encouraged as long as there is a German carp alive in the streams. I feel that it is by encouraging this industry and at the same time maintaining on the statute books the prohibition against planting carp, is the one and only hope of clearing the streams of this inferior food fish.

The history of the German carp is rather interesting. Although called German carp it is in reality not indigenous to German waters, but was introduced into that country from Asia, it is supposed by the Crusaders. It found a congenial home in the European waters and soon spread or were taken to Austria-Hungary, France and England. Huge carp farms were established in Germany and Austria-Hungary, and some started as early as the thirteenth and fourteenth century are said to be still in existence, and there is one farm covering more than forty acres. The German carp was first introduced into the United States about 1870 by a gentleman living in Sonoma, California. Shortly afterwards the fish was taken up by the United States Fish Commission, and the National Government was followed with more or less enthusiasm by individual States. In Pennsylvania the craze for carp culture for a few years was only paralleled by the "Merino sheep craze" and the "Morus multicaulus" or silk worm fever. Only fortunately for the farmers the results were not as disastrous to them financially. Nearly every farmer in Pennsylvania who had a small duck pond or who could dig a pond on his place ventured into carp culture and it was speedily ascertained that the carp could be as easily raised as the authorities claimed it could. But the farmers did not take to the flesh and could not sell it on the markets. Dreams of wealth vanished and the fish were either liberated into the streams by the act of the farmer or gained access thereto through the breasts of the ponds breaking away in flood times. Within five years after the introduction of German carp in Pennsylvania people were as loud in their condemnation of it as they had previously been enthusiastic in its praise.

There are three leading species to be found in our waters, commonly called the scale carp, the mirror carp and the leather carp. Scientifically speaking the first is called *Cyprinus carpio commis*, the second, *Cyprinus carpio speculious*, and the third with the somewhat liberal title of *Cyprinus carpio Coriaceus cive nudeus*. They received their name of scale, mirror and leather carp as follows: The first being covered with scales, the second having one, two or three irregular rows of extraordinarily large scales along the side of the body, and the third or leather carp, because it either has very few scales or practically none with a thick soft skin, velvet to the touch. Of the three, if there can be a choice, the mirror carp is

supposed to be the best for eating purposes. The leather carp will bear transportation the best and is less liable to be injured by bruising. All three have a wonderful vitality. They may be carried long distances by being simply wrapped in wet cloths. As soon as cold weather approaches the carp seeks the deeper portions of the water they inhabit, where if the bottom is muddy they spend the winter in a more or less torpid state. It is claimed that when they seek winter quarters they do so in groups of fifty to one hundred or more, making a cavity in the muddy ground called a "kettle" where they pass the time until spring, huddled together constructing a circle with their heads together. From the time of seeking winter quarters until spring arrives it is believed that they take no food. During the period of hibernating the carp make no growth whatever, but with the approach of warm weather they make up for lost time in this particular. In an ordinary year a carp will make the following percentage of growth in ponds: In May 13 per cent., in June 31 per cent., in July 34 per cent., in August 18 per cent., and in September 4 per cent. It is stated that a carp will sometimes make a growth of three pounds in the first year of its life.

I have stated that the carp is wonderfully prolific. A three or four pound fish will yield from 300,000 to 500,000 eggs at least. There is one consolation, when we regard this enormous number of eggs and that is that the mature fish is just as fond of the eggs of its own kind as it is of the eggs of the black bass or other species of fish.

REPORT OF THE CARP INDUSTRY IN PHILADELPHIA FOR 1905.

Board of Fishery Commission:

Gentlemen: Herewith please find my report of the carp industry on the Delaware river and tributaries for the year 1905. Since my last report on the carp industry for Pennsylvania a number of Jewish fish firms have formed themselves into a company securing a charter under the laws of New Jersey with a capital of \$50,000 for the purpose of engaging in the carp industry which is steadily growing in Philadelphia in size and importance.

The company which consists almost exclusively of Philadelphians, has leased a body of water containing 15 acres in Cumberland county, New Jersey. The company, through its agents, buy all the live carp they can during the summer months when the price is at its lowest point and hold them in the water in New Jersey until the winter months, when they are able to dispose of them at an advance of from eight to ten cents a pound from the original cost.

At the close of the year the company had over 30,000 pounds of carp in its pond which were being held for a freeze-up and a rise in the market. In consequence of the mild winter the fishermen have been able to catch carp all winter and the prices therefore generally ruled much lower than the same period in former years. To give an

idea of the possibilities of the carp industry, I might note the fact that the company which I have just spoken of sold during 1905, 1,500,000 pounds of live and dead carp at an average of five cents per pound. From other points there was shipped to the Philadelphia market 483,000 pounds which was sold at an average of five cents per pound.

About two-thirds of the carp sold in the Philadelphia market are dead and usually a large proportion from points west notably on the Illinois river. The bulk of the live fish come from tributaries of the Delaware in Pennsylvania from the Neshamany creek to Chester in Pennsylvania and from streams in the upper part of Delaware and from tributaries of the river on the New Jersey shore from Olleway's creek to Burlington. Owing to the open weather the total sales of carp in Philadelphia and the amount of money realized were less than in 1904. The total Philadelphia sales being 2,462,000 pounds with a value of \$123,100.

Respectfully,

GEORGE D. SHANNON,
Warden.

REPORT ON THE SHAD INDUSTRY OF THE DELAWARE RIVER FOR 1905.

To the Board of the Fishery Commission:

Gentlemen: Enclosed please find my report, as far as obtainable at this late date, of the shad industry of the Delaware bay and river. The time allowed for gathering material was not sufficient to cover the entire river from Ship John Light to the New York State line. The figures which I here present must be therefore necessarily far below the actual industry for the year. My work was confined almost exclusively from Bay Side, N. J. to Trenton Falls, that is to say in tide-water.

The heaviest catch of shad in the bay is from points between Alloways creek and Ship John Light, a distance of probably 20 miles. From there the fish are shipped to market by steamer and railroad. Two-thirds of the catch of shad are sent to the Philadelphia and Chester markets, or sold to small dealers or individuals in the smaller towns and villages which line the Delaware river in Pennsylvania and New Jersey to Trenton Falls, the remainder are sent to the New York market, Jersey City and the towns between the river and the points named. The Philadelphia market alone handled 412,500 shad, having a value of \$268,375.00. Ten boats between Bristol and Bordentown shipped about 10,000 shad to New York at an average price of 40 cents each or \$4,000. In the neighborhood of 507,270 fish having a value of \$152,181 were sent to New York, Jersey City and intervening towns, to Easton, Doylestown, Newtown, Chester and as before stated, small towns and villages along the Delaware river and the borders of Philadelphia. The total catch of shad in the Delaware during 1905 was not less than 929,770 with a value of \$424,556. These figures show a decrease in the number of shad caught over the season of 1904 by nearly 300,000. On the other hand, from all the information I can gather the price received by the fishermen was much greater and that the aggregate amount of money received by the fishermen was probably greater than for many years.

Most of the shore fisheries on the Delaware river are located on the New Jersey side, although as near as I can learn, a large part of the capital invested is Pennsylvania money.

I would suggest that hereafter the wardens operating along the Delaware river be instructed to gather the statistics concerning the shad industry as well as the industry in other fish during or immediately after the close of the season, in this manner more accurate information can be received.

The above is respectfully submitted by

GEORGE D. SHANNON,
Warden.

PRELIMINARY REPORT ON THE INVESTIGATION OF CERTAIN WATERS OF PENNSYLVANIA.

To the Hon. W. E. Meehan, Commissioner of Fisheries:

Sir: I have the honor to report the progress made in the investigations conducted during the summer of 1905 for the Department of Fisheries.

The general object of this work was "to study the food of fishes, their habits and environments," as stated in our instructions. To do this properly it was necessary to make somewhat extensive collections both of fish and of other water organisms, and to note cases of pollution of streams where this affected the well being of the fish fauna. This work occupied the time of the writer and an assistant, Mr. Charles F. Noll, for nearly three months of the past summer, and collections were made here and there over a large portion of the State. The total number of collections made were 193, including collections of the animal life of the waters investigated and also collections of small microscopic life and occasionally vegetation. Owing to your hearty support and to your wisdom in selecting Prof. H. A. Surface, our able Economic Zoologist, to direct the work, a large amount of material and many valuable observations have been made.

The great amount of care and labor necessary to work out in detail the results of this investigation, and the fact that the writer has had no assistance in the laboratory work, except what Professor Surface has so generously given in his spare moments, makes it impossible to present more than a preliminary report at this stage. Thus far the laboratory work has been confined to the identification and classification of the fishes collected; and the minnows, comprising about half of the collection, remain yet to be identified. Nothing has been done toward identifying the insect larvae or the other animals collected and little definite information can be given until this has been done. It has not been possible to make any food studies from the stomachs of the fishes collected, although it is hoped that a report can be made soon on this important subject, as well as a report giving a list of the fishes collected. Several species new to the State have been found already, exclusive of the group of minnows, and it is probable that others will be found.

Few states have a more varied system of watersheds than has Pennsylvania. Along the eastern border is the Delaware river with its large tributaries, the Lehigh and the Schuylkill, which flows into the Atlantic. In the central part of the State is the Susquehanna, which with its two large branches forms a great basin emptying into the Atlantic further south than the Delaware. This fact explains why it has a somewhat different fish fauna. Along the southern border, in Adams, Franklin, Fulton and Bedford counties are some branches of the Potomac, and there are probably fishes here not found in any other part of the State. In the western part of the State is the Ohio, which empties finally in the Gulf of Mexico, and has a fish fauna much different from that of the eastern rivers. Its

two main tributaries, the Allegheny and the Monongahela probably also differ in the kinds of fishes they contain. In Erie county a few small streams drain into the lake, and in Potter county are the headwaters of the Genessee. Both of these drainage areas pour their waters into the St. Lawrence, and bring a much more northern fauna. Thus we can expect to find a great variety of fish life in the inland waters of the State.

In the present paper the most that can be done is to discuss in a general way the different waters examined, their character and general biological conditions.

The Trout Streams of Central Pennsylvania.

The first work was done in Center county, where 46 separate collections were made. The greater number of streams in this county are trout streams, and each important one will be taken up separately. Spring creek, a rather large creek fed by mountain streams and by two large springs, one at Bellefonte and the other at State College, empties into Bald Eagle creek at Milesburg. Its water is cool and its bottom rocky in most places, forming a fine stream for trout. Brook trout abound in its upper waters, but in the vicinity of Bellefonte the brown trout, introduced by the Fish Commission seems to be most abundant. Food for such fish as the trout is plentiful, consisting of microscopic animals for the young; the larvae of caddis flies, mayflies, stone flies and diptera, and small fishes for the larger ones. Two species of suckers, the common white sucker (*Catostomus commersonii*) and the black sucker (*C. nigricans*), are abundant. The stream is in good condition, except below Bellefonte. There the fishes die occasionally, and the trouble seems to be on the increase. During the latter part of February many fishes have died, chiefly suckers, but some trout also. A number of these fishes have been sent to State College, where Prof. Surface and the writer have examined them. It is difficult to determine from the specimens the cause, but one thing is certain, they do not die from a parasitic disease. The trouble is very probably due to some poisonous material dumped into the stream, as the fish examined were either bottom feeders or had been feeding on the bottom, in the case of the trout. One trout contained caddis flies, cases and all, in its stomach, and the other a number of darters (*Boleosoma nigrum*) which is a fish living on the bottom. An analysis should be made of the water below Bellefonte, and also of the deposit on the bottom of the stream, if there be such. Some step should be taken soon as many fine fish have already been killed.

A trip was taken along Sinking creek in the southern part of Center county. This creek, though not large, is interesting because it rises in a sphagnum bog known as Bear Meadows, and because for part of its course it runs under ground. It abounds with trout, which are very dark colored because of the brown discolored water from decaying vegetation in the swamp. After it emerges from the mountains into cultivated land the trout become scarce, due probably in part at least to the large amount of saw dust in the stream. In its lower part suckers are abundant and a few species of minnows.

Bald Eagle creek was examined above Milesburg. It is broad and flat, rather rapid, with a stony bottom and little vegetation. Larvae

of caddis flies, *Corydalus cornutus* and *Chauliodes* are plentiful; also crayfish and larval bull frogs. The chief food fish are suckers and sunfish, although further down bass are also taken. The bass are said not to be so abundant as formerly. What the conditions are below I do not know, but at Milesburg the biological conditions are satisfactory for abundant fish life.

An interesting comparison can be drawn between two tributaries of this creek, Marsh Run and Beech creek. In Marsh Run there is abundant fish food in the form of larval mayflies, Odonata and Parnidae. Snails, crayfish, leeches, earthworms, mussels and Polyzoa were also collected in it. As to vegetation *Hydrodictyon* and other algae were abundant. Darters, minnows and a small catfish (*Schilbeodes insignis*) were also plentiful. The game and food fish are white and black suckers, two species of sunfish, and small mouth black bass. These latter were quite numerous as young. On the other hand Beech creek contains scarcely any fish food and practically no fish. In the first case all conditions are satisfactory; in the second case the stream is polluted with water from the soft coal mines near Snowshoe. Beech creek was formerly a fine trout stream, but trout are now confined to the small branches in the mountains that do not contain the water from coal mines.

Fishing creek in Clinton county was next visited at Lamar. The stream here is large and rapid, with a rocky bottom. The water is cold and aquatic insects are plentiful, consisting of hellgramites (*Corydalus*), stone flies, mayflies, diptera, chauliodes and parnidae. Darters and dace are abundant. One could tell from the character of the other life that trout were abundant, as they are.

In Huntingdon county a trout stream there, Laurel Run was studied. It is a characteristic trout stream, and the life is much the same as the previous stream, except that insect life is not so abundant with respect to species. Eels are taken at Whipple's dam, and pike have been taken as far up as this dam.

The Susquehanna River.

We collected in the Susquehanna river in three places, at Northumberland, at Kingston, and at Jersey Shore. We were not provided with the apparatus necessary to make a qualitative and quantitative determination of the fish in large bodies of water, and consequently our results are not very satisfactory. The main thing we wished to determine in this stream was the reason for the decrease of black bass especially in the West branch. The general opinion of the fishermen appears to be that the scarcity of bass is due to the large numbers of carp in the river, as they believe that they eat the spawn of other fishes and even young fishes themselves. At the outset it may be said that the investigations of Leon J. Cole for the United States Fish Commission indicate that the damage from carp is "either greatly exaggerated or entirely unfounded." In regard to the case of the black bass he says "the bass have actually increased in numbers in some places from having the young carp to feed upon."

At Northumberland we were told that bass, salmon, pike, sunfish and catfish, which were formerly abundant, are now scarce. However, bass are present, as we collected a few, and also a few rock bass. Food material seems to be scarce. May flies and stone flies

are the chief insect larvae, and snails are numerous. At Kingston on the North branch food is more abundant, especially larval may flies and caddis flies. The tube building and net building caddis flies were both numerous. Polyzoa and spongilla were also noted. The water is very black and dirty from coal dust, yet we saw numbers of young black bass. At Jersey Shore on the West branch fish food is not abundant, a few may flies and stone flies being the insect larvae in greatest numbers. There were quite a variety of food and game fishes collected here, including perch, black bass, rock bass, pike and suckers, yet none were in abundance. Young black bass were very scarce, and we were told that the best anglers had made small captures that season. The water here is rather dark colored and tastes of tan liquor. In fact the odor of tan bark can be noticed before reaching the river. There is even a dirty scum on the water in the eddies. It has been only recently that the tan liquors have been noticed this far down the river, and the worst effects are probably yet to be felt. The cause for the apparent difference in the numbers of fish, especially black bass in the West and North branches of the Susquehanna, is not as evident as would seem, although it looks as though of the two evils, tannery refuse was worse than coal refuse from the hard coal region. More time should be taken for a detailed investigation than was at our disposal.

Other Tributaries of the Susquehanna.

At Bloomsburg a very complete collection of the fishes and other life in Fishing creek was made. Prof. D. S. Hartline of the Normal School took a great interest in the work, advised us where to collect and even went with us for a half day. Rock bass, black bass, sunfish and pike, together with suckers were obtained here. Small fishes are plentiful, as is also food of various kinds. Caddis flies were very abundant. May flies, stone flies, corydalus, Chauliodes and diptera were fairly numerous. On the whole, conditions are favorable to the welfare of the angler's art here. Prof. Hartline gave us a hellbender (*Cryptobranchus alleghaniensis*) which he had collected in the river, and this gives interesting light on the distribution of this salamander. It is generally supposed to live only west of the Alleghanies. It is an important enemy of fishes and of fish food.

A little collecting was done in the vicinity of Harrisburg, but the water was so high here that the work was not very satisfactory. A water snake, practically albino, was taken in Paxtang creek.

In Perry county collecting was done in Montour Run, Sherman's creek, and Big Buffalo creek. Fishes of the kinds present were numerous. Such as suckers, eels, catfish, sunfish and pike. Small fishes are plentiful in these streams, and also fish food of various kinds, crayfish, snails and polyzoa. The water is in good condition.

Pine creek was the last of the Susquehanna tributaries to be visited. There had been numerous reports of the decrease of black bass in it, so we tried to make a pretty thorough investigation. The stream at Jersey Shore contains some deep holes, but above this there seem to be scarcely any deep places and very little shelter for fishes. The stream is broad, flat, with stony or gravelly bottom, and little vegetation. It is of almost uniform depth from a short distance

above Jersey Shore into Tioga county. At the lower part bass are as numerous as for the past two years according to the statement of Rev. W. E. Karns, of Vilas P. O. We saw large numbers of young black bass, and food in the form of may flies, stone flies, hellgramites, etc., is abundant. The water is deep enough to afford shelter, and there appears to be no reason why bass should not be plentiful here. But further up the stream the case is different. A stop was made at Slate Run, and here young bass were scarce, and small fish are much scarcer than at Jersey Shore. The bottom of the creek here is covered with sawdust from a large saw mill, and this would have a bad effect on bass, by covering up their spawning beds. Logs which are floated down during high water probably has a bad effect on the bass by tearing up the spawning beds, but I think the greatest difficulty is in the nature of the stream itself. It is so shallow and there so few deep holes for hiding places that bass cannot become very abundant. This fact, together with the saw dust, is the main cause of the scarcity of bass.

The Potomac Basin.

This was visited in Franklin county, mainly for the purpose of finding whether there were many fishes here not found in other basins. Collections were made in Conococheague at Chambersburg and Marion and Back creek at Williamson. Several smaller streams, including a branch of Antietam creek, were also investigated. In the Conococheague, fish food is abundant, consisting of caddis flies, stone flies, crayfish, gammaris, chauliodes, corydalis dipterous larvae and snails. A few black bass were taken. Catfish, sunfish and suckers were plentiful in places, but high water and rocky bottoms prevented a thorough examination. Trout are abundant in Dickey's Run near Mercersburg.

The Delaware Basin.

Collections were made in the Delaware at Portland and at Easton. At Easton Prof. Davison, of Lafayette College, gave us some valuable suggestions as to where to work. We collected in the Delaware and in Bushkill creek here. The Bushkill is in good condition as far as fish food is concerned. Sunfish, catfish and trout are found here. In the Delaware a few young bass were seen, but not in great numbers. The river here is not nearly so full of various kinds of life as at Portland, where fish food is abundant, and it is probable that bass are more abundant there also; but because of the rocky bottom we could determine little in regard to the kinds and relative abundance of fishes, as a seine could not be used to advantage.

Collections were made in the Lehigh and its branches at Slatington, and at White Haven. At the latter place bass, pickerel, perch, eels and sunfish are said to be abundant, although here also high water and rocks prevented our making as thorough an examination as should have been made. The conditions necessary for a good fish fauna are present, and small fish for the food of bass and pickerel are abundant. Large mouth bass were taken in a small branch of the river at this place. At Slatington there appears to be little fish life in the river and other forms of life are also scarce. Collections

were made in the Schuylkill at Reading, and in Maiden creek. Fish are evidently plentiful, but the details of this work remain yet to be worked out.

The North Eastern Lakes.

Beech Lake in Wayne county was visited in order to get an idea of the life in it. Mr. White, a fish warden there, offered us every facility for work, and some valuable facts were obtained. Quite a variety of food and game fish are found in the lake, but the catch is not large. There is a fair abundance of food in the form of may flies, gammaris, and a few other forms in less abundance, but small fish are very scarce. It is probable that game fish are not plentiful in this and other lakes partly because there is a large amount of fishing done; partly also because small fishes are so scarce that the larger and more rapacious fishes eat their own young from the scarcity of other forms, and in certain cases parasites or disease break out in an epidemic.

Loomis Lake in Susquehanna county was visited to learn if possible the cause of the perch dying there. It is said that they die every few years. Mr. Thomason, who is part owner of the lake, gave us every facility possible for work, but the visit was made so late that few dead perch could be found, and these few were in bad condition. There is evidently no parasitic disease, and no definite cause could be assigned to the trouble, unless, as Professor Surface suggested, the evidence points toward dynamiting. The air-bladders of the specimens obtained were burst, which would indicate dynamite as the cause, although there is a possibility that decay had so far advanced that the air-bladder was easily broken. The fish should be examined shortly after they have died in order to be certain.

Complaints having reached the Department of the black bass dying in Lake Carey, we were directed to investigate that, but here also we arrived on the scene too late. The height of the trouble occurred two years ago, and from accounts seems to have been due to a parasite. We were told that the parasite was sometimes found in the sunfish now, so we collected a number of them. These have not been examined as yet, but if anything is determined, it will be reported later.

The Genessee Basin.

A short trip was made to the headwaters of the Genessee in Potter county to collect material. The stream here is very small, but abounds with life of various kinds. It was one of the most interesting and important trips, zoologically, that was made during the summer. Several species of fish not taken anywhere else during the summer were collected here, but they are minnows, and, as stated before, these have not been identified. Dr. A. E. Ortmann, of the Carnegie Museum in Pittsburg, who kindly identified the crayfish, states that our "discovery of *Cambarus obscurus* in the headwaters of the Genessee river fills a very striking gap in our knowledge."

The Allegheny Basin.

Collections were made at several points in this basin, and some most important facts discovered. At Ridgway a short stop was made to look at the Clarion river. The water is as brown as coffee, due to the refuse from tanneries. It is the foulest stream that we saw during the whole summer. It smells fearfully, and the bottom of the stream and the stones are covered with a gray slimy deposit of considerable depth. There is nothing living in the water except leeches and a few filth-loving worms. What was undoubtedly once a fine stream for fish has been converted into the filthiest thing imaginable.

A very profitable series of collections were made in French creek above Franklin. The creek is large, rapid, with a rocky bottom. It is a fine black bass stream, being deeper and much rockier than Pine creek, which it otherwise much resembles. All sorts of aquatic life flourish in it. Fish food is abundant, and small fish are plentiful. In spite of the difficulty of using a seine, a number of species were obtained. Four different darters were obtained, one of which is rare (*Etheostoma voriatum*). This is given as occurring in the Ohio Valley, and I have found no reference to it as being found in this State. The trout-perch (*Percopsis guttatus*) was taken in abundance in a small branch of this creek. It is rare in this State also. Young black bass were seen in abundance.

The Shenango river was next investigated. This is a fine fishing stream. Bass are plenty, also pike, suckers of various kinds, and muscallonge. This is one of the few streams in this State where the last mentioned fish is taken. Croppies and other sunfish are also found in it. At Sharon we looked up the cause of the death of fish there. Some of the local anglers are very much wrought up over the pollution of the stream by the steel companies there. They showed us where the pollution takes place and aided us in getting samples of the water. We also obtained a sample of the pulverized slag dumped into the river at one point, and this seems to be the main cause of the trouble. The molten slag is dumped into a pit of water, which causes it to break up into fine sand-like particles, but which contain air bubbles, making some of the particles light enough to float. This is then allowed to pass into the stream. It gets into gills of the fishes, and cuts them to pieces. Since, of course, a fish cannot breathe without its gills in good condition, the fish virtually suffocate. If the furnaces would get rid of their slag in some other way it is very probable that there would be less trouble, if indeed there would be any at all. There may of, course, be other injurious substances dumped in the stream, but a chemical analysis of the water is necessary to prove this. The slag is undoubtedly one of the most important causes of the destruction of fish, and it is possible that if the attention of the mill-owners were called to it, they would find some other way to dispose of the slag. If not, other means should be taken.

At Jamestown, in Mercer county, some very important collections were made. The Shenango river here teems with a great variety of life, and fishing is in good condition. Several rare fishes were taken here, among them *Moxostoma anisurum*, *Percina caprodes*, *Campos-toma anomalum*, and *Etheostoma maculatum*. The last two men-

tioned have never been taken in Pennsylvania before to my knowledge. Several species of mussels were collected here that were not taken anywhere else.

The last collection of the summer was made in the vicinity of Indiana. Although there is not a great variety of food fish here, being mainly suckers, sunfish and rock bass, yet two fishes not known hitherto to occur in the State were taken in Crooked creek. These are *Campostoma anomalum*, mentioned before, and a small catfish recorded only from the State of Indiana (*Schilbeodes miurus*).

Thus the work, while not so satisfactory in some respects as could have been hoped for, has been productive of some most valuable results. Such a series of collections extending over so much of the State has never before been undertaken, and cannot help being of great scientific importance. There is still room for much more similar work to be done, as this work has suggested already many important lines of investigation.

In conclusion I wish to extend my thanks to you for your interest and support; to Professor H. A. Surface for his able direction, and hearty interest and help in the laboratory work; to Dr. A. E. Ortman for his identification of the crayfishes collected, and to Mr. Charles F. Noll, whose energy and interest in the field work contributed much towards its success.

Yours respectfully,
W. R. McCONNELL.

OPINIONS OF THE ATTORNEY GENERAL.

The following are the opinions rendered by the Attorney General's Department as to the interpretation of the various points of law submitted to it by the Department of Fisheries:

GIGGING OR SPEARING NOT LEGAL.

Office of the Attorney General,
Harrisburg, Pa., June 23, 1903.

Hon. W. E. Meehan, Commissioner of Fisheries, Harrisburg, Pa.:

My Dear Sir: In reply to your inquires contained in your letter of the 11th inst., I answer that Sections 2, 7 and 8 of the act of May 29, 1901, prescribe the lawful methods of taking fish in this State.

Giging and spearing are not authorized.

The Department of Fisheries can authorize persons to remove carp from the waters of this Commonwealth as its representatives, and name the kind of net to be used by such representatives. There is nothing to prevent the acceptance of a sum of money by the Department in lieu of selling the fish, said moneys to go into the Department of Fisheries for the purpose of fish protection and propagation.

The act of May 8, 1876 (P. L. 146), is the only law covering the subject of pollution of streams which your Department can employ.

Very truly yours,

HAMPTON L. CARSON,
Attorney General.

ONLY ONE TIP-UP LEGAL.

Office of the Attorney General,
Harrisburg, Pa., December 11, 1903.

Hon. W. E. Meehan, Fish Commissioner:

Dear Sir: Replying to your request for an opinion, I reply that, in my judgment, fishing with a line through a hole in the ice, attached to a short stick spanning the hole, popularly known as a "tip-up" is a legal means of taking fish, provided it be confined to one line with not more than three hooks. It may be clearly construed as a hand line, but a series of holes, through which hand lines are used, connected as they are by the solid mass of ice, and multiplying the hands of the owner in taking fish, amounts in effect to a set device which is not permitted by existing acts.

Very truly yours,

HAMPTON L. CARSON,
Attorney General.

FISH-WAYS.

Office of the Attorney General,
Harrisburg, Pa., May 31, 1905.

Hon. W. E. Meehan, Commissioner of Fisheries:

Dear Sir: I have before me your communication of recent date, enclosing a letter from the secretary and treasurer of the Pennsylvania Power Company, in which he makes certain statements in reference to the construction of a dam owned and operated by that corporation. From these statements it appears that the dam in question was constructed during the spring and summer of 1901. You ask for an official opinion as to whether or not, this being the fact, the corporation is subject to the provisions of Section 13 of the act of May 29, 1901 (P. L. 307), which reads as follows:

"That from and after the passage of this act, any person, company or corporation, owning or maintaining a dam or dams, or who may hereafter erect or maintain a dam or dams, in any waters in this Commonwealth, shall immediately, on a written order from the Fish Commissioners, erect therein such chutes, slopes, fishways or gates as the Commissioners may decide necessary to enable fish to ascend and descend the rivers at all seasons of the year; and any person, company or corporation refusing or neglecting to comply with the provisions of this section, shall forfeit and pay the sum of fifty dollars for every month he or they so neglect, which sum or sums shall be recovered by civil suit and process, in the name of the Commonwealth, and when collected shall be paid into the Treasury of the State for the use of the Fish Commissioners. If, after the lapse of three calendar months, the person, company or corporation owning or maintaining said dam or dams, shall neglect or refuse to erect or place the appliances as directed by the Fish Commissioners, the Board of Fish Commissioners are empowered to enter upon such dam or dams, and erect such slopes, chutes or fishways or gates as they may decide necessary; and the cost thereof shall be charged against the person, company or corporation owning or maintaining such dam or dams, to be recovered by the Board of Fish Commissioners by civil suit and process, in the name of the Commonwealth: Provided, That where, by reason of any dam or dams having been constructed prior to the requirement by law of the placing of chutes, slopes or fishways therein, or for any other reason, the owner or owners of, or person or persons maintaining such dam or dams cannot be compelled by law to pay the cost of erecting slopes, chutes or fishways, as provided in this section, the cost of erecting such slopes, chutes and fishways by the Fish Commissioners, as provided in this section, shall be paid by the Commonwealth of Pennsylvania, out of the funds not otherwise appropriated, upon warrants drawn by the Auditor General upon the State Treasurer. The Auditor General to be furnished by said Fish Commissioners with an itemized statement of the cost of such construction, which must be approved by him before he shall draw a warrant for the payment of the same."

I am clearly of the opinion that the said corporation is subject to the foregoing provisions. In an official construction of the act in

question to H. C. Demuth, Esq., treasurer of the Board of Fish Commissioners, on January 23, 1902, a copy of which communication I enclose herewith, I set forth at length my views upon the effect of this act under circumstances somewhat similar to those in the case now before your Department, and have no reason to depart from the conclusions which I reached therein.

Very respectfully,

FREDERIC W. FLEITZ.
Deputy Attorney General.

Office of the Attorney General,
Harrisburg, Pa., January 23, 1902.

H. C. Demuth, Esq., Treasurer Board of Fish Commissioners, Lancaster, Pa.:

Sir: Your letter of recent date to this Department, received. You state therein that the York Haven Paper and Power Company, a corporation operating a paper mill at York Haven, Pa., is constructing a set of wing walls or dams in the Susquehanna river at that point for the purpose of diverting the waters into the wheels of a power plant which it is erecting there, and ask an opinion upon the following questions:

1. Has the above corporation authority to erect a permanent building in the river, and if so, can it be compelled, upon the completion thereof, to place fish ways in the wing walls or dam?

2. Can it be required to place in the head race or canal leading into its wheels such screen or screens as will prevent the passage of fish into and their consequent destruction by the same?

I find upon examination of the records that the corporation in question was organized under the general corporation laws of this State, and has no especial privileges other than those contained in such general laws. In this opinion, however, it is not necessary to pass upon its legal right to build the wing walls or dam mentioned. I assume that your concern in this matter is simply as to the effect which such an arrangement will have upon the fish.

Section 13 of the act approved 29th of May, 1901 (P. L. 302), provides as follows:

"That from and after the passage of this act, any person, company or corporation owning or maintaining a dam or dams, or who may hereafter erect or maintain a dam or dams in any waters in this Commonwealth, shall immediately, on a written order from the Fish Commissioners, erect therein such chutes, slopes, fish ways or gates as the Commissioners may decide necessary, to enable fish to ascend and descend the rivers at all seasons of the year; and any person, company or corporation refusing or neglecting to comply with the provisions of this section, shall forfeit and pay the sum of fifty dollars for every month he or they so neglect, which sum or sums shall be recovered by civil suit and process, in the name of the Commonwealth, and when collected shall be paid into the Treasury of the State for the use of the Fish Commissioners. If, after the lapse of three calendar months, the person, company or corporation owning or maintaining said dam or dams, still neglect or refuse to erect or place the appliances as directed by the Fish Commissioners, the Board of Fish Commissioners are empowered to enter upon such

dam or dams, and erect such slopes, chutes, or fishways or gates as they may decide necessary; and the cost thereof shall be charged against the person, company or corporation owning or maintaining such dam or dams, to be recovered by the Board of Fish Commissioners by civil suit and process, in the name of the Commonwealth: Provided, That where, by reason of any dam or dams having been constructed prior to the requirement by law of the placing of chutes, slopes or fishways therein, or for any other reason, the owner or owners of, or person or persons maintaining such dam or dams cannot be compelled by law to pay the cost of erecting slopes, chutes or fishways as provided by this section, the cost of erecting such slopes, chutes and fishways by the Fish Commissioners, as provided in this section shall be paid by the Commonwealth of Pennsylvania, out of the funds not otherwise appropriated, upon warrants drawn by the Auditor General upon the State Treasurer. The Auditor General to be furnished by said Fish Commissioners with an itemized statement of the cost of such construction, which must be approved by him before he shall draw a warrant for the payment of the same."

This language is plain and unequivocal. It is clearly the duty of the Fish Commissioners to see that it is carried out fully in every respect, and for that purpose they are given the power of enforcing their orders in the courts.

1. I am, therefore, of the opinion, and advise you, that, if upon the completion of the wing walls or dam the Commissioners of Fisheries be satisfied that some artificial devices are necessary to enable the fish to ascend and descend the river freely at all seasons of the year, they have the power under the law to compel the erection of such devices; and upon the failure of the parties in question to build them within three months after having been notified so to do, it is the duty of the Board to construct them and to compel the corporation to pay for the same by the ordinary legal methods.

2. The law bearing upon your second inquiry is contained in section 14 of the above mentioned act, which provides:

"That from and after the passage of this act, any person, company or corporation owning or operating a raceway, flume or inlet pipe, leading to a water wheel, turbine, pump or canal, shall, immediately upon receipt of a written order from the Board of Fish Commissioners, place and maintain a screen or net at the upper end of such raceway, flume or inlet pipe, sufficient to prevent fish from entering therein. Any person, company or corporation refusing or neglecting to comply with such order for a period of one month, shall forfeit and pay the sum of fifty dollars, which sum shall be recovered by civil suit and process, in the name of the Commonwealth, and when collected shall be paid into the Treasury of the State for the use of the Fish Commissioners. If one month after notification, the person, company or corporation, owning or operating such raceway, flume or inlet pipe has not placed such screen or net as may have been directed, the Fish Commissioners are empowered to enter upon such raceway, flume or inlet pipe and place such screens or nets as they may decide necessary; and the cost thereof shall be charged against the said person, company or corporation, and if not promptly paid, such cost may be recovered by the Board of Fish Commissioners by civil suit and process, in the name of the Commonwealth."

What I have said in reference to your first inquiry is equally

applicable to your second. The language is so plain and unambiguous, the intention of the Legislature to provide for such cases is so clear and the method marked out for your board to pursue is so unmistakable as scarcely to call for comment. The large sums of money annually appropriated by the State to protect and propagate game and food fish in the waters of the Commonwealth, and the laws passed to provide safeguards against their wanton destruction, as well as the energetic and thorough work of your board, should enlist the hearty co-operation of every citizen.

I am therefore of the opinion and advise you that it is the duty of your board, under the authority conferred upon you by the Legislature in the act above quoted, to see that the proper steps are taken at once to provide for the safeguards required in such cases as the one before us.

Very respectfully yours,

FREDERIC W. FLEITZ,
Deputy Attorney General.

NETS UNLAWFUL IN THE OHIO RIVER AND TRIBUTARIES.

Office of the Attorney General,
Harrisburg, Pa., June 7, 1905.

Hon. W. E. Meehan, Commissioner of Fisheries:

Sir: Your letter of recent date, asking for an official opinion relative to the authority and duty of your wardens to seize and confiscate any nets or seines carried on house boats in the Ohio river or its branches within this Commonwealth, received.

After a thorough examination of the Acts of Assembly upon this subject I am satisfied that it is unlawful to use a seine for any purpose whatever in the Ohio river and contiguous streams, for the reason that these rivers do not contain any fish which may lawfully be caught with a seine at any time of the year, unless it be carp, which, under the Act of April 26, 1905, may be taken by a seine having a mesh of four inches, between September 1st and June 20th. The law provides that before a seine can be used for the capture of carp, a bond must be given by the person so using the same, which bond must be approved by the court of the county in which the owner of the seine resides.

Section 37 of the Act of May 29, 1901, distinctly provides that "the possession of nets * * * or other devices prohibited or not permitted by law, shall be prima facie evidence of the violation of this Act."

It is therefore the duty of your wardens, in cases where they have knowledge of seines being used from or kept upon house boats in the Ohio river or streams contiguous thereto, to demand the production of the receipt or permit issued by the authorities, allowing the owners of the seine to use the same for the capture and destruction of carp, and upon the failure or inability of the proper parties to produce said bond, to seize and confiscate any illegal net or nets so found.

Very respectfully,

FREDERIC W. FLEITZ,
Deputy Attorney General.

A FISH BASKET LICENSE A PERSONAL PRIVILEGE.

Office of the Attorney General,
Harrisburg, Pa., September 27, 1905.

Hon. W. E. Meehan, Commissioner of Fisheries:

Dear Sir: I have before me your letter of recent date, in which you ask to be officially advised whether the license to operate a fish basket with wing walls for the purpose of taking eels, under the provisions of the Act of April 27, 1903, (P. L. 319) is to be considered as a privilege granted to a particular person or a permit issued for the use of a specific apparatus, in other words, whether it is the person or the thing to be operated which is licensed by the State.

In order to arrive at a proper conclusion, it is necessary for us to consider the language of the Act so that the intention of the Legislature may be understood. The law distinctly provides that the license is to be issued to a person who must be a citizen of this Commonwealth; that the written application made to the Department for the granting of the license must bear "the name and place of residence of such applicant and his description as near as may be;" and that the said certificate or license, when issued, "shall authorize the owner thereof to take eels from the waters of this Commonwealth as provided in the first section of this Act. Said certificate or license shall not be transferable, and shall be exposed for examination upon demand."

In the light of this language it is perfectly clear that the intention of the Legislature was to permit eels to be taken in this manner by certain persons duly licensed by the Department, under certain restrictions and regulations named in the Act. It is equally clear, and I therefore advise you, that the right granted by the license can be enjoyed only by the person named therein, and that this person alone has the right and authority to operate a fish basket constructed in accordance with the law.

I desire, however, to advise you further that your discretionary power in matters of this kind is broad enough to permit you to deviate from the strict letter of the law in individual cases where such a construction would work a manifest hardship to an honest holder of a license, who might, for some unforeseen reason, such as a temporary physical disability, find it necessary to have assistance in fishing the basket, or to have work done temporarily by someone else under his direction and authority, but in all such cases the written permission of your Department should first be applied for and obtained.

Very truly yours,

FREDERIC W. FLEITZ,
Deputy Attorney General.

EEL BASKETS MUST HAVE MOVEABLE BOTTOMS.

Office of the Attorney General,
Harrisburg, Pa., September 27, 1905.

Hon. W. E. Meehan, Commissioner of Fisheries:

Dear Sir: I have before me your communication of the 20th inst., asking for an official opinion upon several question which have

arisen in regard to the proper legal construction to be placed upon the language of the first section of the Act of April 27, 1903, (P. L. 319) which reads as follows:

"That from and after the passage of this Act, it shall be lawful to catch eels in the waters of this Commonwealth, by use of fish baskets with wing-walls: Provided, That every basket so used shall be made of slats not less than one-inch apart, with a moveable bottom, which shall be taken out of each basket, so used, at sunrise, and be kept out until sunset; and no basket shall be used or operated for the taking and catching of eels, excepting from the twenty-fifth day of August to the first day of December in each year: Provided, That the penalty for using said basket at any other time or in any other manner, than is authorized by this Act, and for catching and taking any other fish than eels from the streams or waters of this Commonwealth by the use of such baskets, shall remain as heretofore."

You ask to be advised on these two points:

1. Whether the words "with a moveable bottom, which shall be taken out of each basket so used" mean that the entire bottom of the falls must be taken out or only a portion thereof.

2. Whether the words "That every basket so used shall be made of slats not less than one-half inch apart" mean that this space shall be determined at the time the basket is constructed or after it has been placed in position to be fished, and after the wood is swollen by contact with the water.

In reply to the first question I beg to say that, giving the words used by the Legislature their proper meaning, it is obvious that the word "bottom" means the entire bottom and not a portion thereof. I therefore advise you that, to comply with the letter and the spirit of the Act, the entire bottom of the fall must be removeable and taken out, in accordance with the provision of the law, at sunrise and kept out until sunset.

In regard to your second question, the evident intention of the Legislature was to provide for a space of not less than one-half inch between the slats in the basket while the same was being fished, in order that small fish drawn into the basket should have proper means of escape. It therefore follows that the space provided by the act, to wit: one-half inch between the slats, must be preserved at all times without regard to the space between the slats at the time the basket was constructed; otherwise, any person charged with a violation of the law in this regard might set up the plea that, at the time the basket was constructed, a sufficient space had been left to comply with the requirements, but that by continued exposure to the water the wood had become swollen and the space correspondingly decreased. I am therefore of the opinion, and advise you, that the half inch space between the slats provided for by the Act must exist at all times. Any deviation therefrom constitutes an offense which should be properly and promptly punished.

Very truly yours,

FREDERIC W. FLEITZ,
Deputy Attorney General.

CLOSED SEASON IN BOUNDARY LAKES.

Office of the Attorney General,
Harrisburg, Pa., October 10, 1905.

Hon. W. E. Meehan, Commissioner of Fisheries:

Sir: Your letter of yesterday, pointing out an apparent conflict in terms between Sections 12 and 16 of the Act of April 2, 1905, entitled "An Act to classify the species of fish in such parts of boundary lakes, etc.," and asking for an official opinion relative to the same, is before me.

The first part of Section 12 provides:

"That it shall be unlawful to fish with any nets, or other devices of any description, excepting a rod and line having not more than three hooks, or a hand line having not more than three hooks, or with a trolling line with spoon hooks attached, in any waters of any part of any lakes described in this Act, over which this Commonwealth has jurisdiction, from the 15th day of November of any year to the 15th day of March of the succeeding year."

The section also provides severe penalties for the violation thereof, including fine, imprisonment, confiscation of all boats, nets or other appliances used by the offenders. This language is plain and direct, and no doubt can possibly exist as to the intention of the Legislature in enacting the same.

Section 16 of the Act, however, provides that any person or persons, company or corporation may apply to the Department of Fisheries for a license to operate any boats, nets or other devices in any of the waters where they may be used legally under the provisions of this Act, and upon payment of certain specified fees the Department is authorized and directed to issue such license, "which license shall hold good from the time it is issued until the close of the calendar year in which it is issued."

It appears that some persons holding such licenses contend that, because the licenses are made for one year, they may have the right to fish with nets and other devices, under the authority of the license, in contravention of the express terms of Section 14. In this conclusion I cannot agree. It is entirely clear that there is no conflict between the two sections. Section 16 merely fixes the time when the license shall expire, to wit: the close of the calendar year, and must be read in pari materia with section 14, which fixes the time within which such nets or devices may be legally used. I therefore advise you that the licenses in question confer no right upon the holders thereof to fish with the nets or other devices between the 15th day of November of any year and the 15th day of March of the succeeding year.

Very respectfully,

FREDERIC W. FLEITZ,
Deputy Attorney General.

Office of the Attorney General,
Harrisburg, Pa., November 29, 1905.

Hon. W. E. Meehan, Commissioner of Fisheries:

Sir: I am in receipt of your letter of recent date, relative to the Act of April 2, 1905, entitled "An Act to classify the species of fish

in such parts of boundary lakes," etc. You quote the language of Section 7 and Section 12 of the Act and ask whether, under the wording of the said sections your Department has the right, in case its officers find any nets set in the water of Lake Erie, within the jurisdiction of Pennsylvania, between the 15th day of November in any year and the 15th day of March of the succeeding year, which time is made by the said Act a closed time for the use of such devices, to seize and confiscate the said nets or devices, even though the persons operating said nets are not captured and no arrests can be made and the Department has no knowledge of the ownership of said nets.

In reply I advise and instruct you that, as the confiscation of the nets and devices is merely an additional penalty imposed upon the persons guilty of violating the law, you have the power and authority to seize and confiscate the nets in all cases where the owners cannot be found or apprehended, as well as where this is done.

Very truly yours,
FREDERIC W. FLEITZ,
 Deputy Attorney General.

PROCEEDINGS OF THE SECOND ANNUAL MEETING OF THE
 STATE FISHERIES ASSOCIATION OF PENNSYLVANIA,
 HELD AT BELLEFONTE, CENTRE COUNTY, JUNE 21
 AND 22, 1905.

A number of the representatives of the State Fisheries Association of Pennsylvania gathered in informal meeting on the morning of June 21, 1905, in room 16 of the Bush House, Bellefonte. As some of the incoming trains bearing other representatives were late, it was decided to alter the program slightly, and instead of holding the business meeting then, in the Bush House, to postpone it until the afternoon, when the meeting will be held in the dwelling of the Bellefonte Fish Hatchery. In the meantime, that the assembled representatives should visit and inspect the hatchery.

The citizens' committee of Centre county, of which Mr. Meek, of Bellefonte, was Chairman, provided carriages and drove the representatives from the town of Bellefonte to the hatchery, where the State plant established in 1903 was thoroughly inspected, both as to buildings, ponds containing the growing and brooding trout, the apparatus for automatic feeding and other appliances for propagating trout on a huge scale on a most economical basis.

At one o'clock the representatives were entertained at luncheon in the dwelling of the Hatchery by the individual members of both the Fishery Commission and the Commissioner of Fisheries.

At two o'clock, other representatives having arrived, the meeting was called to order in the parlor of the dwelling.

Twenty representatives were present, embracing nearly all sections in the State. In the absence of the President, Mr. Feely, the Hon. W. E. Meehan, Commissioner of Fisheries, the honorary President, presided.

Letters from a number of other county organizations, numbering fifteen, declaring their intention of sending representatives, were read by the Secretary. The reading of the minutes of the last business meeting held in Harrisburg, in March, was dispensed with.

The presiding officer in a brief speech welcomed the members, saying:

"It gives me great pleasure to meet you again. The gathering of the State Fisheries Association of Pennsylvania, an Association which was organized a little more than a year ago is bound to be fruitful of important results to us and the State at large in connection with fish culture and fish protection. For many years, the county organizations have been laboring and doing good work in both these directions, but they have not been able to perform as effective work alone, because working alone and without knowledge of what the other associations were doing, they could not accomplish desired results. They were like a disintegrated army. A great statesman declared, 'in union there is strength,' by all the county organizations uniting in a State organization, they become a unit and certainly a powerful factor in arousing public sentiment through the necessity of greater fish protection, and will unquestionably possess more power in shaping legislation affecting fish. As an

illustration of what may be done by organizations, I may say that a year ago the organizations passed a resolution, requesting the Legislature to establish as many hatcheries in the State for the cultivation of black bass which would produce as many of this species of fish for public planting as the existing hatcheries do now of trout. While, the Legislature, when it assembled did not create hatcheries to the extent requested, it, nevertheless, authorized the erection of four additional fish hatcheries for the propagation of black bass and other fish, the number being only one less than the entire number of hatcheries now in operation in the State, and when the Wayne Hatchery, which is specifically for black bass is considered, the number of hatcheries in Pennsylvania, for the propagation of black bass, exceeds, by one, the number in operation for trout, lake fish and river fish. By the act of the Legislature, the State will soon have in operation nine fish hatcheries or one more than any other State. Much of the credit of this is due to the active interest of the State Fisheries Association of Pennsylvania. I have no doubt that when this Association becomes stronger, and all the county associations are enrolled in membership, its influence in Pennsylvania will be very great, for it will represent between thirty and forty thousand fishermen. (Applause.)

"There are several things, which during the meeting, I desire to call your attention to, and advise action being taken. With these remarks, I call the meeting formally to order and announce that we are ready for business."

By Col. John W. Hague,

Several members have called my attention to the fact that at the business meeting held in Harrisburg, new officers of the Association were elected, and although I am one of those officers, I have been requested to suggest that the officers then elected be continued until the next annual meeting in 1906.

This was agreed to.

By Mr. Meehan,

I think that before we begin reading any papers, the association should take up business matters and there is one important proposition which I think should be undertaken, namely, how best to secure the greatest protection of fish, the better enforcement of the laws relating to fish, and how in this work the Society and the Commissioner of Fisheries can give each other the greatest amount of aid.

Dr. J. S. McCreight, Ridgeway,

I am glad that this matter has been brought up at this time. I think the Department of Fisheries should send one of its regular wardens in our territory. Illegal fishing is very common throughout Elk county. In fact, it is going on nearly all the time. If a regular warden were sent into the county for a few weeks, it would have a good moral effect, and would greatly help the sportsmen.

By Mr. Meehan,

I am sorry to say that it is not practical for the Department of Fisheries to send its regular wardens into territories in which illegal

fishing is reported, without there being specific cases. The expense of sending wardens into a territory is very great and the appropriation for warden service is very small. Whenever specific cases are reported, even though the testimony is not strong, the Department is warranted in sending a man to work the case up and then to make a still hunt for fish law breakers. If Dr. McCreight and the society he represents will send specific cases, the Department will take them up promptly.

Mr. E. J. Curry, Freeland,

I agree with Mr. Meehan and I do not think Dr. McCreight takes the correct view of the matter. I believe the best way to put a stop to illegal fishing and to get the most effective help from the Department of Fisheries is for the organization in the county to help itself. This morning, in a talk, Mr. Meehan advocated the principle that each Association should have its own wardens for local work, and when difficult special cases arose, call on the Department for assistance. I think that is the right principle, it is that which our Society in Freeland and the Society in Schuylkill and adjoining counties adopt. In our society, we have one of our own members commissioned as a fish warden. He is entirely fearless and performs his duty regardless of consequences. In the performance of his duties he knows no friends. Not long ago, when he was patrolling a trout stream, he came upon a man, who was one of his friends, fishing in a pool. He called upon him to come to shore and show his basket. The man protested, saying, "Mr. Malloy, you know I would not violate the law." Mr. Malloy said, "I don't know anything about it, I only know I am a fish warden and I want to see your basket, if you don't come ashore and show it, I will come in after you." When the man came ashore and exhibited his catch, Mr. Malloy found four under sized trout and he promptly arrested his friend and had him fined forty dollars and costs. That is the kind of a man Mr. Malloy is. His energy in pursuing fish law breakers has made the people afraid to fish unlawfully, and to-day there is very little illegal fishing going on in our section. If the fishermen of Elk county will adopt the same method they will have the same results as we do.

By Mr. Meehan,

I can corroborate what Mr. Curry has said, and other organizations are doing the same thing with good results. The South Fork Association, a representative of which is expected, has asked for the appointment of five of its members as special fish wardens, and other associations are doing the same thing.

By Mr. Curry,

In order to bring the matter before the society properly, I move that it be the sense of this Association that each county organization request the Department of Fisheries to appoint at least three of its members as special fish wardens, and to pledge the members individually to report to said special wardens any case of violation of the fish laws which comes under their observation. And further, that they pledge themselves to appear as witnesses at hearings before the Justice of the Peace.

Mr. W. C. Henry, Parkside,

I think the motion of Mr. Curry proper and I second it heartily.

Mr. Meehan,

The members have heard the motion and are you ready for the question?

Professor H. A. Surface,

I call up the question.

Mr. Meehan,

All in favor of the motion will please say "aye," contrary "no." All having voted in the affirmative, the motion is carried and the Corresponding Secretary will be requested to notify all the associations of the action.

Mr. Meehan,

We have with us Professor H. A. Surface, State Economic Zoologist, and he has an announcement to make which will be made public for the first time and it has been held back especially for the first information to the society. It is in reference to a new line of work to be undertaken by the Department of Fisheries under the direction of Professor Surface. At the meeting last year, there were several papers read on the causes of the rapidly diminishing numbers of black bass. The consensus of opinion was, and I confess I feared it, that the first factor was the German carp. Since then, some facts which have come to my possession, I have been lead to the conclusion that we were in error, that while the German carp may be a factor in causing a lessened number of black bass through their spawn eating habits, it is not always the factor. That there is more probability that the cause may be attributed to the black bass themselves. The facts are briefly these. Susquehanna river from Clark's Ferry dam to the Maryland line, the bass fishing has diminished greatly, and there are undoubtedly thousands upon thousands of carp on the other hand on the north branch where there are as many carp as in the lower river, the bass are appreciably on the increase. Pine Creek, a large tributary of the Susquehanna, emptying into that river near Jersey shore, a stream entirely uncontaminated, was until four or five years ago one of the best bass streams of the smaller fishing in central Pennsylvania. To-day, the bass fishing is almost extinct, and strange to say there are practically no carp whatever in the stream. I am inclined to think, therefore, that a diminishing supply of bass must be attributed to gigging and other unlawful fishing which existed, and to the destruction of food for the bass by the bass themselves. To ascertain the truth of this, two young men under the direction of Professor Surface will this summer make a thorough investigation of the various water sheds of the State and report this winter.

Mr. W. H. Safford,

I have studied the habits of the black bass in Michigan and I find that the young devour an enormous quantity of minute water

life, and it follows that if water life becomes extinct the bass must go. I have found also that the young bass contract cannibalism at a very early age, as soon, in fact, as they become what is known as fingerlings.

Mr. Safford then gave an address on the cultivation of black bass in State and U. S. fish hatcheries.

Mr. W. S. Henry,

I think some action should be taken by which the various county organizations will do as the others are doing. And, I therefore offer the following resolution:

Resolved, That every county association be requested to notify its secretary at the conclusion of every meeting to forward to the Corresponding Secretary of the State Fisheries Association, any matter of general interest that appears on the minutes of said meeting, and that the corresponding secretary be requested to send, at least, quarterly, a synopsis of such proceedings to all the associations.

Seconded by Mr. Curry and adopted.

Mr. Meehan,

I am glad that this resolution has been adopted as I think it will be a great help to all the associations, and as the work of the Department of Fisheries is likely to be of interest to all the societies I would not take it amiss if the society were to request me to give them a quarterly synopsis of the work done by the Department.

Mr. McCreight,

I think Mr. Meehan's offer was a very generous one and I think the societies will be glad to have it done, therefore I move that the Commissioner of Fisheries be respectfully asked to furnish the societies belonging to this organization with a quarterly statement of the work done by the Department, as far as it is compatible with the public interest.

Seconded and approved.

The hour of five o'clock having arrived, it was moved to adjourn until ten A. M. the following morning at the Bush House, in order that the Society might accept the invitation of the Nittaney Country Club to visit its club house.

On motion, adjourned to meet as stated.

The Citizens' Committee then escorted the members of the Society in carriages to Bellefonte where they were put aboard a train and taken to the Nittaney Club, where they were royally entertained and given a supper.

SECOND DAY'S PROCEEDINGS.

June 22, 1905. Meeting called to order at 10 A. M.

Hon. W. E. Meehan presiding.

By Mr. Meehan,

The last question of yesterday was on the food supply of the streams; I would like to ask whether there is any more discussion on that question. If there is not any further discussion, we will take up Mr. Curry's paper.

Mr. E. J. Curry, of Freeland, Pa., read a paper entitled "The Planting of Fry and Fingerlings."

By Mr. Meehan,

I am sorry Mr. Curry's paper is not longer; the subject is one of very great importance; in fact, I do not know of many questions effecting fish protection in our State that is of greater importance than those which have been raised by Mr. Curry. Before taking up the question of nursery streams, that is, setting aside of tributary streams for nursery purposes, I would like to say a few words concerning the catching and killing of small trout. I know that there is quite a strong feeling in certain localities that the limit should be five inches instead of six; it being urged that people catch five inch trout and throw them back, and that a large percentage of them were killed. Mr. Curry has told you that he has knowledge of at least eighty per cent. of these small fish being killed. Now, assuming that to be true, and I think there is no doubt that it is true in certain localities, the question arises, suppose we reduce the size to five inches, what is going to become of the four inch trout? In other words, make the legal size five inches, people will be catching four inch trout and killing them just as quickly as five inch trout. We had the five inch limit in this State at one time and it was unsatisfactory, and the fishermen came to the Legislature and demanded the six inch limit, and we got the six inch limit. My own experience is that the killing of fish by means of bait in nine times out of ten is the fault of the fishermen. Not that it is purposely done, because I do not believe that the real sportsman who uses bait is a man who will deliberately kill a fish; but I have found this, that a man fishing down stream with bait; he has his bait ahead of him, and he gets a little quick snap at his bait and misses; does not get his fish; he recovers his line, looks at his bait, and drops it at the same place. Now a good size fish that is larger than six inches, very rarely misses; when he strikes at a bait he gets it. Three times out of four, yes in nine times out of ten is it true that trout of six inches or over when they are hooked are only hooked in the jaw or in the gills or throat. If a fish is hooked in the throat and carefully taken from the hook, there are good chances of recovery. As an illustration, this spring I was fishing on the Lackawaxen and there was a large fish

broke some distance away. I tried for him several times with a fly and he would not come; so I slipped on a little worm, but before I got down to where he was I had hooked a small one, and when I hooked him, he had the hook in his throat; it was about six inches long or less. I very carefully took that hook out of the throat, sent the fish down to the house, put it in a pond and it remained there for a little while, and for all I know that fish is alive to-day; there was a little bleeding. Now, it happens very often that when a man catches a little fish, they will look at it and say confound it, and give it a shake and shake it off the hook. So that very many of these fish are killed when there is no need for killing them. Even though a large percentage of them are killed, I think it would be very unwise to go back to the five inch limit; I believe that if a change is ever made, that it would be better to take away all limits of size, and cut down the number of fish caught.

As to the question of setting aside tributary streams for nursery purposes. There are several sections relating to streams directly. Section 23 of the Act of the 29th of May, 1901, says: (Read sections 23, 25, 30 and 39).

It would seem to me in taking that 39th section, that the only way that the Department could act would be to secure the consent of the owners of the tributary streams, of these nursery streams, to close them for public fishing until such time as we can induce the Legislature to empower the Department of Fisheries to definitely set aside some streams for nursery purposes. It is a pretty hard matter to say whether or not a stream is barren. In the two years in which I have been Commissioner I have only one knowledge I think in which we could fairly say that the stream is barren. I have held and am supported by the Attorney General that the stream might be considered barren where a man fishing for a whole day would possibly only secure a single trout; that was characteristic of a barren stream; he would either get none, one or two trout out of the whole day's fishing; such a stream would be considered barren.

By Mr. Curry,

That is the point that I would like to cover. It does not make any difference whether you make the limit two, four, six or eight inches, the only way to protect that trout is to prohibit fishing until such time as he is able to work down the stream and take care of himself.

By Mr. Meehan,

The matter is important because there are many streams, especially in Central Pennsylvania, that are really nursery streams, but the water is of sufficient quantity that when the big fish enter them to spawn, that instead of going out in the flow of the main stream, they will remain and spawn where the side streams are. Some of the side streams are as large as some of the regular trout streams in Monroe and Pike counties. These streams are full of little trout; they are so abundant in fact that they very rarely get beyond six or seven inches, and men have come to the conclusion that they are of another variety of trout and call them mountain trout.

By W. C. Henry, Parkside, Pa.,

We have the same thing right at my place; there are any amount of little fish there; a great many of the the D. L. & W. men come down to Scranton to fish that stream. I know there are hundreds of those same little fish destroyed and probably hundreds of them carried away under six inches. The number of fish caught in a day now I believe is limited to fifty; as far as I am concerned, in our club we only allow twenty-five taken, and I think twenty-five fish of a size limit ought to be enough for any man to take in one day; fifteen fish is plenty for me. I would like to see that State law limited to twenty-five instead of fifty, and I make a motion to that effect. We have an association called the Parkside Association and twenty-five is our limit; if any man brings in more than twenty-five fish he gets a fine of ten dollars.

By Mr. Curry,

I have heard of men going out to fish and bringing along two or three of their boys, and in that way the father was able to catch the limit, fifty fish and more. We want to protect the fish, first, so that the fishermen will have something to catch when they go out. These greedy men who fish in these tributaries, they pick up these little fishes and simply kill them and let them float down the stream, and so they never reach the limit size.

By Dr. J. S. McCreight,

To limit the number of fish caught to twenty-five I think is a very good suggestion and I second Mr. Henry's motion.

Mr. Henry moves that the various associations of the State take up and consider the question of asking the Legislature to reduce the number of trout which may be legally caught with one rod in one day to twenty-five, and to report their views to the next meeting of the State Association through their representatives.

Motion seconded and carried.

By Dr. W. H. Reed, Norristown,

I would suggest that we advise these associations of this motion so that they get the sentiment of it.

By Col. John W. Hague,

In reference to barren streams, a few years ago I fished down in Fayette county in company with a gentleman there from early morning until late at night; we caught one little trout about six inches long. So that is one stream I can say is barren in the full sense of the word. We have not in my part of the State many trout streams; our trout streams are a long distance away from us so that I do not have much experience in that line. I can talk more about black bass than I can of the trout. The nearest streams are in Westmoreland county or Fayette county, so that I could not say very much on that subject. This is one experience I had in that particular case.

Prof. H. A. Surface, of State College, then submitted the following resolution:

Resolved, That we endorse and shall urge legislation authorizing the Commissioner of Fisheries to set aside, at his discretion, such small streams as he may find best, as nursery streams, in which fishing shall be prohibited at all times of the year. Said streams to be posted at the lower limit by a conspicuous poster and also at intervals of three hundred yards.

By J. L. Nimick, Ridgway,

It seems incomplete in that there was no time limit for the closing set.

The Chairman replied that it was for all time as to nursery streams.

Motion was made to adopt the resolution, seconded by Colonel Hague and carried.

The Chairman then suggested that, before reading the next paper a motion should be made authorizing the secretary to purchase a minute book.

Dr. Reed made the motion which was duly seconded and carried.

Colonel Hague made a motion that a stenographer be employed to take notes of the meetings, which motion was seconded and carried.

The Treasurer, Dr. W. H. Reed, of Norristown, then made the following report:

Receipts.	
16 Membership Fees,	\$32 00
1 Membership Fee (half paid)	1 00
Amount,	\$33 00
Expenses.	
Printing Bill (Receipt Books).....	\$2 75
Printing Bill (Letter Heads),	5 75
Postage,	86
	\$9 36
Cash Balance on hand,	\$23 64

Dr. McCreight moved that the report be received, accepted, placed on file and bill paid; motion seconded and carried.

Chairman Meehan made the statement that under the by-laws all that is necessary to do is to pay the two dollars annual membership fee to the club which under the rules would entitle them to a representative. Each organization is entitled to one representative and also to one representative for each additional one hundred members that it may have. In case there is a county in which there is no organization, an individual may represent that county until such time as there is a regular organization.

Mr. Curry then submitted the following report:

Committee met and decided to hold our next meeting on the third Wednesday and Thursday of June, 1906, at Corry, Erie county, Pennsylvania.

Colonel Hague made a motion that the report be accepted and that all delegates, clubs, associations, etc., be notified to that effect. Motion seconded and carried.

A paper entitled "Forestry in Its Relation to the Water Supply and the Fisheries," by Charles Wetherill, of Philadelphia, Pa., was then read by the secretary.

Mr. Henry opened the discussion as follows:

A gentleman by the name of ——— is planting 200 acres at the present time; he started in last year; he planted hickory, walnut and all kinds of trees; and just a short time ago he had sent from Germany several large boxes here to plant; and last year his brother told me, I think he said, that they had planted about forty or fifty bushels of hickory nuts.

By Mr. Meehan,

It is fortunate I think that the State is extending as it is its forestry preserves, because it is calculated to bring about the condition that Mr. Wetherill hopes to bring about. It is the practice I believe to purchase those tracts from which the timber has been cut and then work the timber up again, and in course of time, when that timber becomes of certain size, to thin it out and sell it and use the money for additional tracts of land. I think every one of us who have passed our boyhood days, we are not getting old, however, notwithstanding the gray in our hair, can all remember some of the prominent streams; to-day the water supply is far less than it was years ago; moreover that it is unequal. One day the stream banks will be full; a few days afterward there will be hardly any water. I have one stream in mind in the North Eastern part of Pennsylvania; Saw Creek. When I was a boy, fishing in Saw Creek, I think no part of it but that could be fished at all times. Now, a week after a rain storm, you will see no water whatever in parts of it; you can hear it strike underneath the rocks; and it does not take very much of a rain either to cover these stones. I can well remember the time when every spot in that section was covered always by a depth of less than one foot of water; now a day or two at most it is covered.

By Mr. Henry,

Where the timber has been taken away, the streams seem to diminish every year; they keep going down. The other streams where the timber has not been taken away, as West Branch, Paradise, and others, are holding up very well.

By Mr. Urell, of Tioga county,

It is the same way up in Tioga county; a fine stream there where you could catch a basket of large trout. Now the timber has been cut down, and there is not enough water to stock the stream.

By Mr. Meehan,

In connection with this matter, which is very apropos to this paper, is this question of polluting streams. For years the fishermen have

been trying to have some acts passed through the Legislature which will put a stop to the pollution of streams, but every measure was defeated by the owners of tanneries, etc., who simply came forward with the tremendous argument "Would you destroy our splendid industries for a few fish?" Last winter this Association met in Harrisburg as a purely business meeting to try to pass some legislation, and a bill was submitted and approved and presented by Senator Godcharles, of Northumberland county; it only affects five industries at the present time, but it is merely the entering wedge. In the mean time, Dr. Penrose, of Philadelphia, had drawn three bills, which he introduced. After reading those bills very carefully, they found that it covered the question more thoroughly than the Godcharles bill. The Legislature was with us, and they simply used the Godcharles bill as sort of a scarecrow. We took a good many of the associations into our confidence and wrote to the members, especially the doubtful ones, to support the Godcharles bill. We took up the local boards of health, and there were some 750 of them; and more than 500 of them sent resolutions. The result was the Penrose bill passed the Legislature and was signed by the Governor. There was only one feature about the bill that caused Dr. Penrose to lament. The Tannery Trust was powerful enough to enforce an amended bill. At first when it was passed it affected but four tanneries; to-day nearly every tannery uses vitriol.

In order that you may know exactly, I would suggest that these acts be read.

Secretary Hague read act No. 215, entitled "An act creating a Department of Health and defining its powers and duties."

Act No. 236, entitled an act creating the water supply commission of Pennsylvania; defining its duties, fixing the scope of its authority and powers, and making an appropriation for the payment of the salaries and expenses connected therewith.

Act No. 182, entitled an act to preserve the purity of waters of the State for the protection of the public health.

By Mr. Meehan,

In addition to these three acts passed by the Legislature, there is one other statute already in force under the act of May 8, 1876.

By Mr. Meehan:

There is another matter that I could like to bring to the attention of the association for congratulation. At the first meeting of the association in March last year, a resolution was adopted in effect asking the Legislature to direct the establishment of a sufficient number of hatcheries to produce the same number of black bass as are now in use for brook trout. The Legislature directed the erection of three such hatcheries, and adequate appropriation for the building of such hatcheries was provided, but the Governor on account of all the appropriations asked for having been granted by the Legislature to all Departments and charities was compelled to cut our appropriation, which makes it impossible to put the three hatch-

eries fully and squarely on their feet. It is hoped to locate one of those hatcheries in the eastern part of the State, one in the southern and one in the western part of Pennsylvania.

In pursuance of my promise I would like to make a report of the work done by the Department of Fisheries.

At the last session of the Legislature a resolution passed authorizing the Commissioner of Fisheries to invite the United States and New Jersey to join with it in the propagation of shad and other fishes on the Delaware river and the offer was accepted. Had it not been for a very poor season on the river, an enormous lot would have been hatched.

Subsequent another resolution was passed by the Legislature authorizing the appointment of a commission consisting of three members of the House, two members of the Senate, and the Commissioner of Fisheries to meet a similar Commission, appointed by the State of New Jersey, New York, Delaware and Maryland to endeavor to formulate uniform fish laws and to perform joint fish hatching work in the Delaware river.

This year the Legislature gave an appropriation of \$55,000 as against \$25,000 two years ago.

By Secretary Hague,

Yesterday there was mention made about the violations by Hungarians, Austrians and others, of the streams. My experience last year was this, I kept and maintained for quite a long time at my own expense a club of from two to four men on the Allegheny river; we had a tent and on the opposite bank was a gang of Italians alleged to be doing dynamiting business. Frequent reports were heard. We thought that we were going to make a whole lot of money; had men up constantly night and day. We failed after all the expenditure of our money and time to find a single violation of the law. One day just after a thunder storm we heard a very slight explosion within about a stone's throw to the depot. Instead of dynamite being exploded, we found a man hunting musk rats, and the explosion we heard was the discharge of a No. 10 shot gun. But while we failed to make any showing there, we have made another showing, one that could not be reported. Just below a certain dam on the Allegheny river, the increase of black bass was enormous; and it was utterly impossible to keep them from taking out these small bass. Whatever violations had been going on before there was stopped by the maintenance of that camp. I suppose now the river will be teeming with fish at that point. The wall-eyed pike still is maintained there. The fish are still there and during the last season they propagated. Down along the waters where the gravel was thick, you could get any quantity of them 3, 4 and 5 inches long. At the same time the gar is just as abundant. While we have done good in one point, we have still done bad in another; the same protection is given to the gar as to the other fish. The deposit from the oil refineries has settled on the bottom of the rivers, and there are other pollutions there that have been mentioned; saw dust, tanneries, etc. I believe the Big Beaver along there to the mouth of the river is almost totally destroyed so far as black bass are concerned, from the latest reports there are no more. There are carp there

where I was fortunate enough to cause two arrests. There are still dynamiters on that river; but I do not think from my own observation that it is being done now. I think the arrest of those two men, the death of one and the imprisonment of the other will stop that. And if there are any more violations in that neck of the woods, I think we will catch the offenders and either imprison them or fine them. The same thing has been going on in the neighborhood of Brownsville.

On the other side in Washington county, just across the river, found men fishing by outline in the day time without sufficient lead to weight it to the bottom of the creek. Then we found some Sunday fishing. I have within the last two months driven off from the banks at least two hundred people; one Sunday found forty in a bunch. Did not arrest them; there was no complaint made, and another thing our jails are full out there; they have been trying to get people out of jail.

Then there was violation of the law with regard to selling wall-eyed pike during the close season. One man I know obtained two hundred barrels of wall-eyed pike in one week. He secured every store keeper, every Italian, every Dago and every other vile person he could get hold of to take these fish around and sell them quickly. My men have seen strings of pike and perch sold and the stopping of these prosecutions has encouraged them in it. I think we have the sentiment of the community, and I believe if we have the sentiment of everybody that we are right and the matter ought to be stopped, that it will be stopped. We are doing all we know how, resorted to all methods we know how to make to stop this illegal selling, and we are willing to receive all suggestions, hints, orders and everything else that will be given to us to help us. We don't care what the people think; we have our conception of what our duty is and we do not care if we offend one man or a thousand men if we are right. We feel we are right, and as long as we have got that feeling we don't care whose toes we tramp on. If we find the court will sustain us we will have a pretty nice bunch of fines there. There is a lot of fines in the hands of the magistrate that have been paid in and I don't believe they have been paid over to the county treasurer; it is there, but it has not been paid over to the county treasurer.

By Mr. Meehan,

I have noticed advertisements in various papers of an electrical device for catching fish; this device is known as "Vim Bait." There is a law in Pennsylvania against fishing with electricity. I communicated with the manufacturer and sent him a copy of the clipping. He immediately entered into correspondence with the owner of "Vim Bait," and he wrote me a few days ago that he had received a reply from the company, stating that the fish were not caught by actual electricity, but they had some sort of an incandescent light which lured the fish to the bait. If they are putting this incandescent light on the bait for the purpose of luring the fish, they are violating the law, and one thing is quite sure arrests will be made for using such device. I would be very glad if any association comes across any person using this device they will make report.

By Dr. McCreight,

In regard to destruction of the fish by catching them, I think in catching small fish it is a matter of care on the part of the fishermen in ninety-nine cases out of a hundred whether they are killed or not. Out of five hundred fish caught under size, we did not lose a half dozen. We used bait altogether.

By Mr. Meehan:

I think if the fishermen would use a little larger hook, and if they get a strike and miss it, not to put their line back in that place, a great many small fish would be saved.

By Mr. Curry,

How many go on the stream who are looking out for the welfare of the fish? A four to five inch trout will swallow the hook, and any fish will die that is hooked in the gills.

By Mr. Meehan:

Use a little larger hook and not catch a fish when they fail to strike I think is a good plan.

By Mr. Curry,

Would it be wise to recommend a limited size to the hook as well as the trout?

By Dr. McCreight,

I would recommend more fly fishing than bait fishing.

By Mr. Curry,

Before we close I make a motion that we extend our thanks to the Nittany Rod and Gun Club, and also to the citizens in general of Bellefonte for the kind and generous hospitality during our stay in Bellefonte. Motion seconded and unanimously carried.

By Dr. McCreight,

I think we should congratulate our Commissioner on his work and extend him a vote of thanks, and I make a motion to that effect. Motion seconded and carried.

By Mr. Meehan,

I very deeply appreciate this. I have taken an interest in fish culture for many years; have always been a fisherman and an angler. Caught my first trout when I was eight years old. When the Governor honored me by placing me at the head of the Fish Commissioners, I made up my mind to do the best I could to increase fish life in the waters. I felt I could not do it alone and that I needed the help of men like yourselves. I am trying of course to help the associations. Without the associations I could not do the work I have accomplished. And while you have given me thanks, you should not

forget the board connected with the Department. The board has been a great feature in the work that has been done.

By Colonel Hague,

We will include the Board of Fisheries in that motion of thanks.

By Mr. Nimick,

I make a motion that we adjourn until an hour to be named later by the chairman.

Motion seconded and carried.

Adjournment.

Evening Meeting.

The meeting was called at 8 o'clock in the evening in the Bush House, Mr. Meehan presiding.

LIST OF FISH COMMISSIONS OF THE UNITED STATES AND THE STATES.

Department of Commerce and Labor.
Bureau of Fisheries.
Washington.

Bureau of Fisheries.

Commissioner—George M. Bowers, The Shoreham.
Deputy Commissioner—Hugh M. Smith, 1209 M Street.
Chief Clerk—I. H. Dunlap, The Marlborough.
Assistant in Charge of Division of Inquiry Respecting Food Fishes—B. W. Everman, 412 T Street.
Assistant in Charge of Division of Fish Culture—John W. Titcomb.
Assistant in Charge of Division of Statistics and Methods—A. B. Alexander.
Disbursing Agent—W. P. Titcomb, 2237 Q Street.

GOVERNMENT HATCHERIES.

Name and Location.

Green Lake, Me., E. E. Race, Superintendent.
Craig Brook, East Orland, Me., Charles G. Atkins, Superintendent.
Nashua, N. H., W. F. Hubbard, Superintendent.
St. Johnsbury, Vt., E. N. Carter, Superintendent.
Gloucester, Mass., C. G. Corliss, Superintendent.
Woods Hole, Mass., E. F. Locke, Superintendent.
Cape Vincent, N. Y., Livingston Stone, Superintendent.
Battery, Havre de Grace, Md., J. N. Wizner, Superintendent.
Bryan Point, Md., L. G. Harron, Superintendent.
Fish Lakes, Washington, D. C., C. K. Green, Superintendent.
Wytheville, Va., George A. Seagle, Superintendent.
White Sulphur Springs, W. Va., R. K. Robinson, Superintendent.
Erwin Fishery, Tenn., Vacant.
Cold Springs, Bullochville, Ga., J. J. Stranahan, Superintendent.
Tupelo, Miss., C. P. Henkel, Superintendent.
Edenton, N. C., S. G. Worth, Superintendent.
Put-in-Bay, Ohio, S. W. Downing, Superintendent.
Northville, Mich., Frank N. Clark, Superintendent.
Duluth, Minn., S. P. Wires, Superintendent.
Quincy, Ill., S. P. Bartlett, Superintendent.
Manchester, Iowa, R. S. Johnson, Superintendent.
Neosho, Mo., H. D. Dean, Superintendent.
San Marcos, Tex., J. L. Leary, Superintendent.

Leadville, Colo., W. T. Thompson, Superintendent.
Spearfish, S. D., D. C. Booth, Superintendent.
Bozeman, Mont., James A. Henshall, Superintendent.
Baird, Cal., G. H. Lambson, Superintendent.
Clackamas, Ore., Claudius Wallich, Superintendent.
Baker Lake, Wash., Henry O'Malley, Superintendent.

Arizona.

T. S. Bunch, Safford, Arizona.
Eugene Allison, Jerome, Arizona.
W. L. Pinney, Phoenix, Arizona.

California.

W. W. Van Arsdale, President, San Francisco, Cal.
W. E. Gerber, Sacramento, Cal.
John Bermingham, Jr., Pinole, Cal.
Address all communications to California Fish Commission, Mills Building, San Francisco, Cal.

Colorado.

J. M. Woodward, State Game and Fish Commissioner, Denver, Colorado.

Connecticut.

George T. Mathewson, Commissioner, Thompsonville, Conn.
Robert G. Pike, Commissioner, Middletown, Conn.
E. Hart Geer, Commissioner, Hadlyme, Conn.

Delaware.

Charles J. Luff, Commissioner of Fish and Fisheries, Wyoming, Delaware.

Idaho.

William N. Stephens, State Game Warden, Rexburg, Idaho.

Illinois.

S. P. Bartlett, Commissioner, Quincy, Illinois.
N. H. Cohen, Commissioner, Urbana, Illinois.
Henry Kleine, Commissioner, Chicago, Illinois.

Indiana.

Z. T. Sweeney, Commissioner, Columbus, Indiana.

Kansas.

Dell W. Travis, State Game Warden, Pratt, Kansas.

Maine.

Leroy T. Carleton, Commissioner, Winthrop, Maine.
J. W. Brackett, Commissioner, Phillips, Maine.
E. E. Ring, Commissioner, Orono, Maine.
A. R. Nickerson, Commissioner of Sea and Shore Fisheries, Boothbay Harbor.

Maryland.

James D. Anderson, Commissioner, Deals Island, Md.
Charles F. Brooks, Commissioner, Sandy Spring, Md.

Massachusetts.

John W. Delano, Commissioner, Marion, Mass.
Edward A. Brackett, Winchester, Mass.
George W. Field, Chairman, Sharon, Mass.

Michigan.

Freeman B. Dickerson, Commissioner, Detroit, Mich.
George M. Brown, Commissioner, Saginaw, Mich.
Charles D. Joslyn, Commissioner, Detroit, Mich.

Minnesota.

Uri L. Lamprey, President, St. Paul, Minn.
H. G. Smith, First Vice President, St. Paul, Minn.
O. J. Johnson, Second Vice President, St. Paul, Minn.
D. W. Mecker, Secretary, St. Paul, Minn.
S. F. Fullerton, Executive Agent, St. Paul, Minn.

Missouri.

W. H. Huges, Vice President, St. Louis, Mo.
J. M. Shortal, Secretary, St. Louis, Mo.
John Gable, Jr., Browning, Mo.

Nebraska.

John H. Mickey, Commissioner ex-Officio, Lincoln, Neb.
George L. Carter, Traveling Deputy, Lincoln, Neb.
W. J. O'Brien, Superintendent Hatcheries, Lincoln, Neb.
State Fish Hatcheries, Gretna, Nebraska.

Nevada.

George T. Mills, Commissioner, Carson City, Nevada.
Pat McCarran, Commissioner, Tonapah, Nevada.
H. H. Coryell, Commissioner, Wells, Nevada.

New Hampshire.

Hon. Nathaniel Wentworth, Hudson Center, N. H.
Hon. Merrill Shurtleff, Lancaster, N. H.
Charles B. Clarke, Concord, N. H.

New Jersey.

Richard T. Miller, Camden, N. J.
David P. McClellan, Morristown, N. J.
Benjamin P. Morris, President and Treasurer, Long Branch, N. J.
Percy H. Johnson, Bloomfield, N. J.
James M. Stratton, Protector, Long Branch, N. J.

New York.

James S. Whipple, Commissioner, Albany, New York.
J. Duncan Lawrence, Deputy Commissioner, Albany, New York.
John D. Whish, Secretary, Albany, New York.

Ontario.

Hon. J. O. Reaume, Commissioner.
S. T. Bastedo, Deputy Commissioner.

Oklahoma.

Eugene E. Watrous, Game and Fish Commissioner, Enid, Oklahoma.

Ohio.

Thomas B. Paxton, Cincinnati, Ohio.
James F. Rankin, South Charleston, O.
D. W. Greene, Dayton, O.
Paul North, Cleveland, O.
George W. McCook, Steubenville, O.
George C. Blanker, Secretary, Columbus, O.

Oregon.

Geo. E. Chamberlain, Governor, Salem, Oregon.
F. I. Dunbar, Secretary of State, Salem, Oregon.
Charles S. Moore, State Treasurer, Salem, Oregon.
H. G. Van Dusen, Master Fish Warden, Astoria, Oregon.
H. A. Webster, Deputy Fish Warden, Astoria, Oregon.

Pennsylvania.

Hon. W. E. Meehan, Commissioner of Fisheries, Harrisburg, Pa.

Fishery Commission.

Hon. John Hamberger, Erie, Pa.
Hon. Henry C. Cox, Wellsboro, Pa.
Hon. Andrew R. Whitaker, Phoenixville, Pa.
Hon. W. A. Leisenring, Mauch Chunk, Pa.

Rhode Island.

Henry T. Root, Providence, Rhode Island.
William P. Morton, Johnston, Rhode Island.
J. M. K. Southwick, Newport, Rhode Island.
Charles W. Willard, Nesterly, Rhode Island.
Adelbert Roberts, Woonsocket, Rhode Island.
Albert Davis Mead, Providence, Rhode Island.
William H. Boardman, Central Falls, Rhode Island.
James M. Wright, Foster, Rhode Island.
Herbert N. Gardiner, Barrinton, Rhode Island.
Philip H. Wilbour, Little Compton, Rhode Island.
George W. Hoxie, Charlestown, Rhode Island.
John H. Northup, Warwick, Rhode Island.
James C. Collins, Clerk, North Providence, Rhode Island.

Tennessee.

Joseph H. Acklen, State Warden, Nashville, Tenn.

Utah.

John Sharp, Commissioner, Salt Lake City, Utah.

Vermont.

H. C. Thomas Stowe, Commissioner of Fisheries, Stowe, Vt.

Virginia.

Dr. John W. Bowdoin, Chairman, Bloxom, Va.
Seth F. Miller, Secretary, Mathews, Va.
George B. Keezell, Keezeltown, Va.
Henry M. Tyler, Richmond, Va.
Robert J. Camp, Suffolk, Va.

West Virginia.

James H. Marcum, Fish and Game Warden, Huntingdon, W. Va.

Wisconsin.

Calvert Spensley, President, Mineral Point, Wis.
Jas. J. Hogan, Vice President, La Crosse, Wis.
E. A. Birge, Secretary, Madison, Wis.
William J. Starr, Eau Claire, Wis.
Henry D. Smith, Appleton, Wis.
Jabe Alford, Madison, Wis.

Wyoming.

Samuel H. Campbell, Superintendent Fish Hatchery, District No. 1, Laramie, Wyo.
C. W. Morgareidge, Superintendent Fish Hatchery, District No. 2, Sheridan, Wyo.

Washington.

Albert E. Mead, Governor, Olympia, Washington.
Geo. G. Mills, Treasurer, Olympia, Washington.
T. R. Kershaw, Fish Commissioner, Bellingham, Washington.

Texas.

Hon. I. P. Kibbe, Port Lavaca, Texas.

New Mexico.

Page B. Otero, Game and Fish Warden, Santa Fe, N. M.

Oklahoma.

Eugene E. Watrons, Game and Fish Commissioner, Gutrie, Oklahoma.

Georgia.

A. T. Dallis, Superintendent of Fisheries, LaGrange, Ga.

THE OPINIONS OF THE VARIOUS COURTS, SUPERIOR AND COUNTY.

When the Department of Fisheries was organized it proceeded to conduct its work with the idea that the two acts of May 29, 1901, the permissive act of April 27, 1903, and the act of April 6, 1903, covered all the methods by which fish could be taken in the waters of the Commonwealth and the boundary lakes. As cases were tried it was found that there was diversity of opinion among the judges of the State as to the interpretation of the law regarding fishing, but in the main the views of the Department have been sustained. Below we give the opinions of the courts on the cases which were heard:

Selling Game Fish from Lake Erie Out of Season.

In March, 1904, the Department directed the wardens to arrest persons who were selling wall-eyed pike and other game fish during the close season. Warden Hague arrested Lawrence Knapp and Henry Knapp, of Pittsburgh, for selling black bass out of season. They were convicted before C. C. McGovern and fined \$20 and \$10 a piece for two fish. From the decision of the alderman the defendants took an appeal to the court of quarter sessions where the conviction was confirmed in the following order:

In the Court of Quarter Sessions of Allegheny County, Penna.

Commonwealth	}	No. 20 March sessions, 1904.
vs.		
Lawrence Knapp and Henry Knapp.		
Commonwealth	}	No. 21 March sessions, 1904.
vs.		
W. J. Wyland.		

Appeal from decision of Alderman Charles C. McGovern.
Filed March 23, 1904. Hearing fixed for

Appeal showed bond to be given in the sum of \$50.00, to be approved by Clerk of Courts.

Order of the Court.

June 3, 1904, these cases came on to be heard and upon inspection of the petition and record, the conviction is affirmed.

By the Court.

From the Record.

Attest:

FRANCIS X. BARR,

Clerk.

In the spring of 1905, Warden Hague arrested Charles Beilstein for having in his possession ten wall-eyed pike during the close season, the same being dead. The defendant was convicted before the

14—23—1905

alderman and sentenced to pay a fine of \$100. He took an appeal to the court of Allegheny county which court reversed the opinion of the court the year before in the following opinion:

In the Court of Quarter Sessions of Allegheny County, Penna.

Commonwealth	} No. 37 March sessions, 1905. Appeals from summary conviction.
vs.	
Charles Beilstein.	

Shafer, J.

The defendant was charged before an alderman of the city of Pittsburgh, by John Hague, fish warden, with having in his possession, the same being killed, ten wall-eyed pike, between the 15th day of February and the 15th day of June, contrary to Section 3 of the Act of May 29, 1901.

Testimony was taken, which, for the purposes of the case counsel for both parties admitted to be true, from which it appeared that on April 14, 1905, the defendant had in his possession and for sale in the city of Allegheny, ten blue pike, which fish had been caught in the waters of Lake Erie by a boat having a license from the State of Pennsylvania to fish in those waters. Some question was made as to whether the fish which were in the possession of the defendant were properly called blue pike, or wall-eyed pike, but for the purposes of this case we find that there was no difference and that while the fish which the defendant had in his possession may more correctly be called blue pike, they are within the meaning of the term wall-eyed pike in the Acts of Assembly.

The Fourth section of the Act of May 29, 1901, P. L. 302, provides that after the passage of the Act, "It shall be unlawful to catch, kill or have in possession, the same having been killed, any blue pike or wall-eyed pike, and that any person violating the provisions of this section shall be subject to a fine of ten dollars for each fish."

Section 32 provides that the prohibitions and penalties provided in this Act shall not apply to any lake partly within the boundaries of this State, nor to any fish caught in the same.

In the case of the Commonwealth vs. Wilkinson, 139 Pa. St. 298, an act in regard to the killing of quail or having the same in possession after the same have been killed, in substantially the same form as the present Act was construed by the Supreme Court to apply only to persons having in their possession quail which was in fact killed contrary to the Act. And it was held in effect in the case that in order to secure a conviction the Commonwealth must show not merely the possession of the forbidden game or fish after it had been killed, but that it was in fact killed contrary to the Act.

We are therefore of opinion that the testimony not only fails to show any violation of the Act in question, but affirmatively shows that there is no such violation, which it was not necessary for the defendant to do.

The judgment of the magistrate is therefore reversed, and restitution of fine and costs is awarded.

From the opinion of the Allegheny County Court the Commonwealth appealed to the Superior Court which affirmed the decision of the court below thus making it legal to sell wall-eyed pike, bass

and other game fish taken in Lake Erie and offered for sale in the Commonwealth during the close season.

It will be observed, however, that the Supreme Court sustains the contention of the Department that in a prosecution for having game or food fish in possession out of season, the burden is upon the defendant to prove that the fish were lawfully caught either in another State or in Lake Erie.

Commonwealth, Appellant, vs. Beilstein.

Fish laws—Wall-eyed pike—Criminal law—Act of May 29, 1901, P. L. 302, and May 29, 1901, P. L. 335.

A person cannot be convicted under the Act of May 29, 1901, Section 3, P. L. 302, for having in his possession for sale wall-eyed pike, in the city of Allegheny, between February 15 and June 15, where it appears that the fish in question were lawfully caught in the waters of Lake Erie under the permission granted by the Act of May 29, 1901, P. L. 335. In a prosecution on such a charge the burden is upon the defendant to prove that the fish were lawfully caught and killed in Lake Erie.

Argued October 2, 1905. Appeal, No. 37, April T., 1906, by plaintiff, from judgment of Q. S. Allegheny Co., March T., 1905, No. 37, reversing judgment of justice of the peace in case of Commonwealth vs. Charles Beilstein. Before Rice, P. J., Beaver, Orlady, Smith, Porter, Morrison and Henderson, J. J. Affirmed.

Appeal from summary conviction. Before Shafer, J.

The facts are stated in the opinion of the Superior Court.

Error assigned was the judgment of the court.

John W. Hague, for appellant.—The very fact that a party has in his possession, killed game fish, during the close season, has always been recognized as pointing to a violation of the close season, and has always been considered an effective police regulation. To permit wall-eyed pike and other game fish, to be sold by fishermen, of the boundary lakes, throughout this Commonwealth during the close season, is at once to destroy the effect of the having possession of killed game fish as a police regulation; and to occasion such a condition as will shut the door against the discovery of violations of the fishing laws.

J. M. Shields, for appellee, cited: Com. vs. Wilkinson, 139 Pa. 298.

Opinion by Morrison, J., November 20, 1905:

The defendant was charged and convicted before an elderman of the city of Pittsburgh with having in his possession, the same being killed, ten wall-eyed pike, between February 15 and June 15, contrary to Section 3 of the Act of May 29, 1901, P. L. 302. After the conviction of the defendant he appealed to the court of quarter sessions of Allegheny county.

At the hearing in court it was proved and admitted that on April 14, 1905, the defendant had in his possession, for sale, in the city of Allegheny, ten blue pike which fish had been caught in the waters of Lake Erie by a boat and fisherman having a license from the State of Pennsylvania to fish in those waters. For the purpose of trial and decision it was agreed that the fish in question were blue or wall-eyed pike and within the meaning of the Acts of Assembly in regard thereto.

The defendant, appellee, contended that the provisions of the Act of May 29, 1901, did not make it unlawful to have killed wall-eyed pike in his possession in Allegheny county; they having been caught in Lake Erie, and that the thirty-second section of the Act expressly provides that the act shall not apply to any lake partly within the boundaries of this State nor to any fish caught in the same.

The learned court below adopted the appellee's theory of the law and reversed the judgment of the magistrate and ordered restitution of the fine and costs. From this judgment the Commonwealth appealed and filed the following assignments of error: 1. The court below erred in making the following order for judgment, namely, "The judgment of the magistrate is therefore reversed and restitution of fine and costs is awarded." 2. "The court below erred in holding that the appellee had not violated the third and seventeenth sections of the Act of May 29, 1901, P. L. 302, although the court found that the appellee had in his possession and for sale ten killed wall-eyed pike on April 14, 1905, in the city of Allegheny, which fish had been caught in the waters of Lake Erie by a boat having a license from the State of Pennsylvania to fish in those waters." 3. "The court erred that the burden of proof was on the Commonwealth to show not merely the possession of the forbidden fish, after it had been killed, but that it was in fact killed contrary to law." 4. "The court erred in not sustaining the judgment of the alderman." 5. "The court erred in not holding the right to fish in Lake Erie did not give the right to sell killed wall-eyed pike in Allegheny county, during the closed season, in which it was unlawful to fish in Allegheny county, and in the interior waters of the State for wall-eyed pike."

Careful consideration of the conceded facts in this case and the provisions of law applicable thereto does not convince us that the court erred in reversing the judgment of the magistrate and awarding restitution. The third section of the act of 1901, supra, as to its prohibition and penalty, must be read and considered in connection with the title of the act. By the title the prohibition and penalty is clearly limited to the public waters within the State. The thirty-second section of the same act reads: "The prohibition and penalties provided in this act shall not be construed or held to apply to any waters forming the boundary line between this and any other State, over which this State has concurrent jurisdiction with such State, so far as such waters form such boundary line; nor to any lake partly within the boundaries of this State, nor to waters on any peninsula or of any bay adjacent to or connected with such lake, nor to any fish caught in any of the waters in this section mentioned."

Section seventeen of the act reads: "That from and after the passage of this act, it shall be unlawful to purchase, sell or offer for sale, or have in possession, the same having been caught in this Commonwealth, any dead game or food fish, except during the lawful period for catching the same and the space of six days after such period has expired."

The legislature also passed on May 29, 1901, P. L. 335, an act "for the protection and increase of fish in such parts of boundary lakes, of more than five thousand acres, as this Commonwealth has jurisdiction over, and in waters of any peninsula or in any bay adjacent to or connected with such lakes; to declare the species of fish in said

waters which are game fish and those which are commercially valuable for food; to regulate and provide for the payment of license fees for the catching of the same; to provide penalties and punishments for the violation of any of the provisions of this act, and to repeal all laws inconsistent herewith."

An examination of this act makes it clear that a licensed fisherman may catch and kill the fish in question in the present case, during the closed season as to the waters described in the Act of May 29, 1901, P. L. 302, and, therefore, in our opinion, the legislative intent is clear that the penalty provided in the last mentioned act cannot be made to apply to a person having in his possession and for sale, fish caught in Lake Erie by a boat and fishermen licensed under the provisions of the Act of May 29, 1901, P. L. 335. We think this is made clear by the plain reading of the thirty-second section of the Act of 1901, P. L. 302. In our opinion, it is manifestly unreasonable to suppose that the legislature made it lawful to catch and kill the fish in question in Lake Erie during the closed season as to the interior waters of the State, and then provided a severe penalty against citizens of Pennsylvania purchasing and having in their possession for sale fish lawfully caught in Lake Erie by duly licensed fishermen. If this is not the correct construction of the acts in question, then what is the meaning of the said thirty-second section. It plainly provides that the prohibition and penalties therein shall not be construed or held to apply to any lake partly within the boundaries of this State nor to any fish caught within the waters in this section mentioned. Manifestly Lake Erie is one of the waters referred to in this section and if the prohibition and penalties do not apply to any fish caught therein, it is absurd to say that the prohibition and penalties apply to a fish dealer in Allegheny county who had in his possession for sale some of the fish, lawfully caught in Lake Erie, to which the said prohibition and penalties do not apply.

We think the question here raised is in principle ruled by *Commonwealth v. Wilkinson*, 139 Pa. 298. That case arose under the ninth section of the Act of June 3, 1878, P. L. 160, which, as amended by section 1, Act of April 25, 1889, P. L. 53, enacts that "No person shall kill or expose for sale, or have in his or her possession after the same has been killed, any quail or Virginia partridge between the 15th day of December in any year and the first day of November next following under a penalty of \$10.00 for each bird so killed, exposed for sale or had in possession." By the thirty-third section of said act it is provided: "In all cases of arrests made for the violation of each or any of the foregoing sections of this act, the possession of the game, fishes, birds, animals, fowls, nets or other devices provided for or so mentioned, shall be prima facie evidence of the violation of said act."

The defendant in that case was convicted and fined for having in his possession, within the State of Pennsylvania, some of the prohibited game within the closed season, which had been killed outside of the Commonwealth. The Supreme Court, in an opinion by Mr. Chief Justice Paxson, held: "The meaning of the act, as we view it, is that no quail shall be killed in this State between the dates specified, and no person shall have in his possession or offer for sale any quail so killed in this State." The court clearly decided that the prohibition and penalty did not apply to a person in this State hav-

ing in his possession and offering for sale, within the closed season, quail which had been killed in another State.

We are unable to distinguish the principle involved in that case from the one under consideration. Under the two acts of Assembly referred to, the fish caught in Lake Erie lawfully, may be held in possession and sold in Allegheny county precisely on the same ground that the quail killed in another State were lawfully held in possession and offered for sale in this State.

This conclusion requires us to dismiss the assignments of error because none of them require the reversal of the judgment. But before closing we desire to refer to the third assignment. It is not well drawn but it raises the question as to where the burden of proof lay. At the trial the defendant assumed the burden and proved that the fish were lawfully caught and killed in Lake Erie. This we think was correct. The fish being found in the possession of the defendant during the closed season and his defense resting upon the exceptional provisions of the act of Assembly, the burden rested upon him of showing that the fish were caught in Lake Erie. To hold otherwise would have the effect in many cases of making it impossible for the Commonwealth to convict a defendant who has in his possession fish unlawfully caught in the inland waters of the State, during the closed season. We think the facts shown by the Commonwealth in the present case called upon the defendant to show where the fish were caught, if he desired to make a defense. We, therefore, sustain the third assignment of error but in view of the way in which the case was tried, this does not in any manner impeach the correctness of the judgment. The case was correctly tried and a proper conclusion reached and we sustain this assignment for the reason that we do not wish it to be understood that this court adopts the theory that in such a case the burden rests on the Commonwealth of showing where the fish were caught.

The judgment is affirmed.

FYKE NETS TO WING WALLS UNLAWFUL.

In September, 1904, Louis Levendoski, of Nanticoke, was arrested for using a fyke net attached to wing walls in the Susquehanna. He was convicted before a justice of the peace, H. P. Robins, of Nanticoke, and sentenced to pay a fine of twenty-five (\$25.00) dollars. The defendant carried the case to the court of quarter sessions of Luzerne county on a writ of certiorari. The court dismissed the writ and filed the following opinion:

Com. of Pa.,	} In Quarter Sessions of Luzerne County. Vio-
vs.	
Louis Levendoski.	

lation Fish Laws.
No. 1075 October Term, 1904.

Certiorari—Exceptions.

Opinion by G. L. Halsey, A. L. J.

"The proceedings before the magistrate were under the Act of 29th of May, 1901, P. L. 302. The information made before the mag-

istrate upon which the warrant issued, alleged upon oath of A. Bauer, State Fish Warden, "that on the 7th, 8th, 9th and 10th days of September, 1904, at the county aforesaid, Louis Levendoski, Nanticoke, Pa., did unlawfully use fyke nets in the waters of this Commonwealth namely, the Susquehanna river below the Nanticoke dam, and that said fyke nets were attached to wing walls." Upon this information the warrant issued and the defendant, Louis Levendoski, was brought in, tried, convicted and sentenced.

The first exception to the record is that the information does not set forth the statute by virtue of which the defendant was arrested. It sets forth the offense alleged to have been committed, "that they used fyke nets attached to wing walls in the Susquehanna river." This was alleged to have been in violation of section eight of the Act of May 29, 1901, P. L. 304, which provides that from and after the passage of the act, it shall be lawful to use fyke nets in the waters of this Commonwealth not inhabited by brook or speckled trout for the capture of eels, provided such fyke nets shall be without wings and shall not be set to any wing wall. We think the information in the statement of the offense met the requirements of the statute. *Com. vs. Avenger*, 2 Luz. Leg. Reg. 177.

The second exception is based upon the contention that the record is not full enough as it does not allege that the nets were in a stream not inhabited by brook trout. This is not well taken because if the nets were in a stream so inhabited, it would emphatically be in violation of the second section of the act. The nets of the defendant could not be in the water unless the waters were not inhabited by brook trout.

The third exception is not well taken as the nets as appears from the record, "were set to wing walls."

As to the fourth exception, it is substantially covered by the second and third exceptions.

The fifth exception is that the record does not show that the defendant committed any offense or was convicted of any. The magistrate finds that the defendant, Louis Levendoski, is convicted of the offence charged in the information that he is adjudged convicted of the violation of the said eighth section of the Act approved May 29, 1901, namely, of having fyke nets set to wing walls.

The proceeding was instituted as particularly directed under the eighth section of the Act of May 29, 1901, P. L. 313.

Exceptions are overruled and record affirmed.

John H. Dando, for Commonwealth.

P. M. Thornton, Contra.

A DYNAMITE CASE.

On May 26, 1905, Frank Herman, John Will and Charles Doyle were arrested for using dynamite in the Susquehanna river. They were convicted before Alderman A. K. Spurrier and sentenced to pay a fine of one hundred (\$100) dollars. From this judgment, they appealed under the Act of April 22, 1905, P. L. 284. The Commonwealth moved to strike off the appeal on the ground that the Act of 1905 under which the appeal was taken was unconstitutional.

The court sustained the contention of the Commonwealth and struck off the appeal and the defendants settled the case by paying the fine and costs. Following is the opinion of the court:

Commonwealth	} In the Court of Quarter Sessions of Lancaster County.
vs.	
Charles Doyle, Frank Herman, John Will.	

Opinion.

The above named defendants were convicted on May 26, 1905, of a violation of section 26 of the Act of 29th May, 1901, P. L. 302, before an alderman of the city of Lancaster, and sentence was imposed upon them. On the same day they appealed from the judgment of the alderman to this court, without allowance of such appeal by the court or one of the judges thereof. The Act of 22d April, 1905, P. L. 284, which is an amendment of the Act of 17th April, 1876, P. L. 29, authorizes appeals in cases of summary conviction, without allowance of the court, to which the appeal is taken, or a judge thereof. It is contended however that this amendment is unconstitutional, and we are asked to strike off these appeals.

Article 5, Section 14, of the Constitution of Pennsylvania, provides, "In all cases of summary conviction in this Commonwealth or of judgment in suit for a penalty before a magistrate, or court not of record, either party may appeal to such court of record as may be prescribed by law upon allowance of the appellate court, or judge thereof, upon cause shown." This section of the Constitution, as at first adopted by the Constitutional Convention, did not contain the words "upon allowance of the appellate court, or judge thereof, upon cause shown." These words were added, by an amendment, for the purpose of preventing an enormous mass of business from the magistrates throughout the Commonwealth, from the mayors of our cities, and from the chief burgesses of our boroughs, being thrown into our courts of quarter sessions and common pleas, as would result if appeals were allowed as a matter of right. See debates of Constitutional Convention, Volume 6, page 338, and Volume 7, page 515.

The Act of 22d April, 1905, P. L. 284, authorizing an appeal from a summary conviction without allowance of the court, or a judge thereof, upon cause shown, is clearly in conflict with this section of the Constitution, and defeats the very purpose of its adoption. The Legislature does not have the power to thus set at naught a provision of the Constitution, and the Act of 22d April, 1905, P. L. 284, is therefore unconstitutional and void. We therefore make absolute the rule to strike off these appeals.

Rule made absolute. Appeals stricken off.

A. B. HASSLER,
Judge.

ARE SUCKERS UNDER THE LAW?

On April 20, 1905, W. J. Humma and George Kenney were arrested by Warden George D. Shannon and taken before Justice of the Peace J. M. Prutzman, charged with using an illegal device. The device consisted of umbrella bows, which were stuck in the ground on to which the fish lines were attached and to each bow was attached a small bell so that when a fish bit, the fisherman went and raised the line. The justice of the peace discharged the prisoners and the Commonwealth took an appeal. This appeal was dismissed by the court because under the Act of April 22, 1905, the right of the appeal had been taken from the Commonwealth. The Commonwealth had the case re-opened and the matter was argued in the court of Berks county. The Commonwealth claimed that the Act of 1905 was unconstitutional. Between the hearings, the Act of 1905 was decided unconstitutional, and the court of Berks county disposed of the case without reference to the question of the constitutionality of the Act of 1905.

The court decided that as the parties were fishing for suckers they were not liable to any penalty because, in spite of the decision of the Superior Court in Commonwealth vs. Seechrist, suckers are not protected under the Act of May 29, 1901. The court therefore discharged the rule. From this decision, the Commonwealth has taken an appeal to the Superior Court. The following is the opinion of the Berks county court:

Commonwealth	} Court of Q. S. of Berks Co.
vs.	
Kenney and Humma.	

No. 651 Misc. Dock p. 326.
Rule for re-argument.

Defendants having been on April 20, 1905, discharged in a summary proceeding before a justice of the peace for alleged violation of the fish law of 29 May, 1901, P. L. 302, the Commonwealth on April 25, 1905, was allowed an appeal under Act 17th April, 1876, P. L. 29. In the meanwhile Act 22, April, 1905, P. L. 284, had been approved amending the Act of 1876 so as to restrict the right of appeal in such proceedings to the defendant. When the cause came up for hearing in September, 1905, the appeal was dismissed on the ground that, at the time when it was granted, there was no statute in force allowing it. Since then it has been decided by Judge Ehrgood, in Commonwealth against Light and Hess, Q. S. Lebanon county, No. 62, September Sessions, 1905, and by Judge Trexler in Commonwealth vs. Weiler, et. al., Q. S. Lehigh county, No. 36, September Sessions, 1905, that Act of 22d April, 1905, is unconstitutional. Thereupon this rule was obtained. At the hearing of it at the December, 1905, argument court, all that could be gone into upon a re-argument was discussed by counsel on both sides, as if the cause were up for re-argument. It may therefore, be now disposed of without reference to the question of the constitutionality of the Act of 1905.

The charge against defendants was "fishing—with lines attached to umbrella bows, with bells fastened to the tips," the evidence showing that one the defendants had 13, the other 4 of these, and that between them they took 9 suckers. In other words they were catching suckers in the manner described. It is contended on the part of the Commonwealth that this method of fishing is unlawful and punishable under the Act of 1901, no matter what sort of fish may or may not be taken by means of it; and in support of contention the decision in *Commonwealth vs. Seechrist*, 27 Pa. Superior Court 423 (see page 426), is referred to. A careful reading of that decision however does now show that it was intended to lay down so broad a proposition.

The Act of 1901, undoubtedly designed to be a codification of former fish laws: *ibid.*, is entitled with great precision as—

"An act to declare the species of fish which are game fish, and the species of fish which are commercially valuable as food, and to regulate the catching and encourage the propagation of the same," etc., etc.

It is clear, therefore, that the statute can not have reference to any other species than those which it shall declare to be either game or food fish, and that all its provisions must relate to the catching, etc., of such. It not only gives no notice of the purpose to include anything else, but on the familiar principle, *expressio unius est exclusio alterius*, distinctly excludes from the operation of the act whatever is not therein declared to be within the one or the other category. It calls upon every one to ascertain what is embraced in the statutory definition of game and food fish, and exonerates him from any inquiry concerning what is omitted therefrom. Section one accordingly proceeds to declare what are game and what are food fish, and what those respective terms as used in the statute are intended to embrace. Suckers are found in neither enumeration. The act being in its title stated as intended to regulate, not the general subject of fishing in the waters of the Commonwealth, but of fishing for game and food fish as classified and enumerated by the statute, it would seem to have nothing to do with suckers. It is true that these are mentioned in sections 7, 8, 9 and 11, describing the time, mode, etc., in which fishing for certain kinds of fish is to be permitted and impliedly making others unlawful, and that suckers would undoubtedly be covered by the language of section 31 allowing "the taking of any fish not herein specifically designated as game or food fish, at any time of the year, with rod, hook or line, or with hand line not having more than three hooks." But in view of the specific and therefore restricted (see *Page vs. Allen* 58 Pa. 338, 346) title of the enactment, which makes the enumeration in section 1 decisive of what the statute is to apply to, it can not be held that the attempt, in subsequent parts of the statute, to apply it to suckers is of any effect whatever. So to hold would conflict with Article III, Section 3, of the Constitution, and the rule established under it by such decisions as *Dorseys Appeal*, 72 Pa. 192; *Allegheny County Home's Case*, 77 id. 77; *Browns Estate* 152 id. 401; *Philadelphia vs. Market Company* 161 id. 522; *Moore vs. Moore*, 23 Pa. Superior Court 73. This question was not before the Superior Court in *Commonwealth vs. Seechrist*, *supra.*, and can not therefore be regarded as decided by it.

If the view indicated of the Act of 1901 is correct it is clear that there never was anything in the Commonwealth's appeal in this case, quite apart from the inquiry whether it was entitled to an appeal at all. In these circumstances it should serve no useful purpose to make this rule absolute, and therefor—

The rule to show cause is discharged.

By the Court.

Jan. 2, 1906.

ACT OF APRIL 22, 1905, UNCONSTITUTIONAL.

On August 14, 1905, John F. Weiler, Harvey Mohr, Harry Desch and Oscar Acker were arrested on the charge of fishing with a seine net in the waters of Helfrich's Spring near Allentown. They were found guilty by the alderman and fined. They took an appeal to the court under the Act of April 22, 1905. The counsel for the Department moved to strike off the appeal on the ground that the act under which it was taken is unconstitutional. The court decided the act unconstitutional in the following opinion:

Commonwealth	In the Court of Quarter Sessions of Lehigh County. No. 36, September Sessions, 1905.
vs.	
John F. Weiler, Harvey Mohr, Harry Desch, Oscar Acker.	

Opinion of Court.

The parties were charged with having violated the Act of Assembly, approved April 26, 1905, by fishing with a seine net in the waters of Helfrich's Spring. They were adjudged guilty by the alderman and sentenced to pay a fine and costs. They entered bail for their appearance at the next term of court of quarter sessions. There was no allowance from the judge of said court and the case was called by the Commonwealth before indictment found and objection made and motion entered to strike off the appeal.

The Act of Assembly approved April 22, 1905, P. L., amending the Act of the 17th of April, 1876, provides: That in cases of a summary conviction the defendant may by entering good and sufficient recognizance to answer said complaint on a charge of misdemeanor, appeal from the judgment of the magistrate to the court of quarter sessions of the county.

It will be observed that the right to appeal is limited to the defendant and that the allowance of the court or any judge thereof is dispensed with.

Upon the argument of the matter, counsel for the Commonwealth contended that the act is unconstitutional and for that reason the appeal in this case was not properly taken. Article 5, Section 14, of the Constitution of 1874, provides: "In all cases of summary conviction in this Commonwealth, or of judgment in suit for a penalty

before a magistrate, or court not of record, either party may appeal to such court of record as may be prescribed by law, upon allowance of the appellate court or judge thereof upon cause shown."

We need not here discuss the law of summary convictions. The courts have decided that they have a place in our system of laws and are not inconsistent with the right of trial by jury.

Whilst the lower courts are slow to declare any act unconstitutional, still where the violation is clear, the duty of the court is obvious. The fourteenth section of article fifth, above referred to, very plainly gives either party the right to appeal but leaves only the legislature the right to prescribe the court to which the appeal may be taken and explicitly states that it must be upon allowance.

I am unable to see how the legislature can change these provisions. To my mind the matter is too clear for argument. The act is unconstitutional.

Now, October 27, 1905, the motion to strike off the appeal by reason of the fact that no allowance was had is granted and the appeal is stricken off and quashed.

[Seal.]

By the Court.

(Signed)

FRANK M. TREXLER,
President Judge.

I hereby certify that the foregoing is a true and correct copy of opinion of court as found upon the record.

MILTON J. HOFFMAN,
Clerk of Q. S.

Commonwealth	}	In the Court of Quarter Sessions of Lehigh County. No. 37, September Sessions, 1905.
vs.		
John F. Weiler, Harvey Mohr.		

Opinion of Court.

For the reasons in the opinion this day filed in the case of Commonwealth vs. John F. Weiler, et al., No. 36, September Sessions, 1905, the appeal in this case is stricken off and quashed.

[Seal.]

By the Court.

(Signed)

FRANK M. TREXLER,
President Judge.

From the record,

MILTON J. HOFFMAN,
Clerk of Q. S.

FISHING IN PRIVATE WATERS.

After this decision, counsel for the defendant petitioned the court for an allocatur nunc pro tunc largely on the ground that as the act of the Legislature of 1905, under which they had taken their appeal was unconstitutional, therefore they ought to have the right

to be heard on showing cause. The court dismissed the petition in the following opinion:

Commonwealth of Penna.	}	In the Court of Quarter Sessions of Le- high County. No. 36, September Term, 1905.
vs.		
John F. Weiler, et al.		

Petition for an Allocatur Nunc Pro Tunc.

Opinion of Court.

The defendants were arrested for violating an Act of Assembly, approved the 26th day of April, 1905, P. L. 310; the charge being that of fishing with a seine net in the waters of Helfrich's Spring in the township of Whitehall, contrary to said act.

The defendants were found guilty by the magistrate, were sentenced to pay a fine of twenty-five dollars each and appealed without asking the allowance of court, relying upon the Act of the 22d day of April, 1905, P. L. 284.

Upon motion to strike off the appeal, I filed an opinion in which I declared that the Act of 1905 was unconstitutional. The defendants thereupon presented this petition for an allowance nunc pro tunc.

In view of the circumstances of the case, I consider this petition, for an allocatur, the same as if it were originally presented, without reference to the former section of the court quashing the appeal.

Should the court grant the appeal? Has an injury been done to the defendants?

The act complained of is practically admitted, at least, it is not denied.

The allowance of an appeal being a matter within the discretion of the court the petitioner should come before the court with the utmost good faith. The allegation of the complaint should be denied.

Commonwealth vs. Appel 25, Pittsburgh Leg. Jour. New series 226:

If there is no denial of the charge, it may be presumed that the alderman was right in finding the defendant guilty. The only question then remaining would be, admitting the facts, so do they come within the purview of the act or is the act under which they were sentenced unconstitutional?

The act of the 26th of April, 1905, P. L. 310, under which the charge was brought applies to any of the waters of this Commonwealth and covers a pond of the kind referred to at the hearing and in which the offense was committed.

The pond had an outlet into another stream and whilst there might have been some difficulty in fish ascending the stream and entering the pond, there certainly was nothing preventing the fish from descending.

The regulation of fishing in the waters of the Commonwealth comes within the police powers of the State and the courts have recognized its exercise in a number of cases.

At the argument there were a number of defects pointed out in

the record of the justice, but they are such as should have been taken advantage of by certiorari.

Now January 22, 1906, allocatur is refused.

By the Court.

(Signed)

FRANK M. TREXLER,
President Judge.

Lehigh County, ss.:

I, Milton J. Hoffman, Clerk of the Court of Quarter Sessions of Lehigh county, Pa., hereby certify that the foregoing is a true and correct copy as found on the record.

(Signed)

MILTON J. HOFFMAN,
Clerk.

[Seal.]

ACT OF APRIL 25, 1905, UNCONSTITUTIONAL.

In August last, Warden Shoemaker arrested J. E. Allen, of Bradford county for using a fish basket which did not comply with the provisions of the Act of April 27, 1903. He was convicted before the magistrate and sentenced to pay a fine of twenty-five dollars and costs. An appeal was taken under the Act of April 22, 1905, whereupon the Commonwealth moved to strike off the appeal on the ground that the act was unconstitutional. The court sustained the Commonwealth in the following opinion:

Commonwealth	}	In the Court of Quarter Sessions of Bradford County, Pennsylvania. No. 14, December Sessions, 1905.
vs.		
J. E. Allen.		

Rule to Strike off Appeal from Summary Conviction.

The defendant was found guilty of fishing with an illegally constructed eel basket and duly sentenced to pay a fine of twenty-five dollars and costs. An appeal was taken to the quarter sessions without allowance by the court. The rule was taken before indictment found, to show cause why the appeal should not be stricken off, raises the question of the constitutionality of the Act of April 22, 1905, P. L. 284.

Article 5, Section 14, of the Constitution provides, "In all cases of summary conviction in the Commonwealth, or of judgments in suit for a penalty, before a magistrate, or court not of record either party may appeal to such court of record as may be prescribed by law, upon allowance by the appellate court, or a judge thereof upon cause shown." Under the Act of April 17, 1876, Section 1, either party could appeal from a summary conviction to the court of quarter sessions upon allowance by that court, or a judge thereof upon cause shown,—a right guaranteed by the Constitution. As to judg-

ments in a suit for penalty, the Act of 1905 amending the Act of 1876 works no change, but in cases of summary conviction permits the defendant without allowance of the court to appeal as of course, a privilege or right not accorded to the other party. The act clearly offends against Section 14, Article 5 of the Constitution above quoted, which provided for, and prescribes the method of, appeal in cases of summary conviction and is therefore inoperative.

This act has already been judicially considered in the case of Commonwealth vs. Wieler, et al., and a similar conclusion reached.

And now, January 16, 1906, rule absolute, appeal stricken off and quashed.

By the Court,
A. C. FANNING, P. J.

ILLEGAL EEL BASKETS.

During the first months of the Department there was a diversity of opinion in regard to the Act of April 27, 1903, which permits the taking of eels by means of eel baskets. In Cumberland county, Judge Biddle, in a dictum, expressed the idea that eel pots and eel baskets are synonymous, quoting the Century dictionary, when, as a matter of fact, there is no more resemblance between the two than between a fishing rod and a flat iron. He also said that the Act of 1903 provided no penalty.

This opinion was followed by a similar one by Judge Hart, of Lycoming county, and also by Judge Landis, of Lancaster county. The Department decided to make a test case, and on October 10, 1903, a warrant was sworn out by Warden Parker against Isaac Seechrist charging him with using a fish basket without taking out its bottom between sunrise and sunset, and also neglecting to take out a license.

The case was tried before Jeremiah Rife, an Alderman in Lancaster city, who found Seechrist guilty and sentenced him to pay a fine of \$25. Seechrist took out an appeal which was dismissed on account of irregularities. He then took out a certiorari, but it was not sustained as it was not issued within the required twenty days. In default of payment of fine, the Alderman sentenced Seechrist to jail for a period of twenty-five days. The defendant then sued out a writ of habeas corpus, and Judge Landis discharged the prisoner on the ground that in neither the Act of May 29, 1901, nor in the Act of April 27, 1903, was a penalty provided for the offence charged against the defendant. The Commonwealth then took an appeal to the Superior Court.

On March 14, 1905, Judge Orlady, of the Superior Court, handed down an opinion in which the contention of the Department was sustained, that persons who did not take out licenses under the terms of the Act of April 27, 1903, were guilty of using an illegal device and punishable under the Act of May 29, 1901. The Court also sustained the contention of the Department that all the provisions of

the Act of April 27, 1903, regarding a moveable bottom must be complied with or the person will be punishable under the Act of 1901. Below is the opinion of the Court:

March 14, 1905. Opinion by Orlady, J.

The essential requisites in a case of summary conviction have been declared and enumerated so clearly and forcibly in Commonwealth vs. Borden, 61 Pa., 272; Commonwealth vs. Davidson, 11 Pa., Superior Court, 130; Commonwealth vs. Ayers, 17 Pa., Superior Court, 356; Commonwealth vs. Gilbert, 170 Pa., 426, and the authorities therein cited that nothing would be gained by reviewing them.

The complaint in this case was that the defendant did "use a fish basket, without taking out such movable bottom at sunrise, and keep out such movable bottom until sunset, for fishing * * * and did neglect to take out the license required authorizing fishing with eel baskets; said fish basket being a device used for fishing by defendant not permitted by, and being contrary to, the acts of Assembly of the Commonwealth of Pennsylvania in such cases made and provided." After due notice the defendant appeared, and a full hearing was had before the alderman who determined the guilt of the defendant and convicted him, as stated in the record, "that the said Isaac Seechrist did maintain and use the said fish basket or device as charged in the information and complaint made." The judgment was entered and sentence imposed in strict conformity with Sections 38 of the Act of May 29, 1901, P. L. 302, which prescribes the penalty for violations of that Act. The complaint was a specific charge of maintaining and using a fish basket or device not permitted by and contrary to law.

The defendant took an appeal from the judgment of the Alderman which was subsequently stricken off for irregularities. He then sued out a certiorari, on the hearing of which every item of defense which is here presented was urged in the court below, and his exceptions were overruled. The judgment of the alderman thus become absolute and can be disregarded only for want of jurisdiction. A writ of habeas corpus was next allowed on his petition in which he alleged that he was confined unjustly in the custody of the constable by virtue of the commitment issued by the alderman. After a hearing the prisoner was discharged for the reason, as stated by the learned court below, that the Act of April 27, 1903, P. L. 319, does not prescribe any penalty for the offenses alleged in the complaint "under which the proceedings were had and that there was no other violation of the fish laws." This conclusion was reached upon the finding by the court—that the complaint sets forth but two offenses, one, the use of a fish basket without taking out its movable bottom at sunrise and keeping it out until sunset; and the other for failure to take out a license. The Commonwealth sued out an appeal and the order discharging the relator from custody being a final one (Commonwealth vs. Butler, 19 Pa., Superior Court, 626), we have the whole record before us. The interpretation of the complaint by the lower court is certainly more narrow and restricted than that given to it by the alderman, who found that the defendant maintained and used a fish basket or device as charged in the information, which in said complaint is declared to be "a device for fishing not permitted by and contrary to law;" and the defendant evidently so understood it as shown by the record, "defendant sworn and gives

evidence that the fish basket or device is in and on his premises as charged." In order to avail himself of the provisions of the act of April 27, 1903, the defendant must have complied with its provisions, else the fish basket or device described in and on his premises as charged was an illegal construction, not warranted by any statute and violative of the provisions of the Act of May 29, 1901, P. L. 302, which is a codification of the former fish laws. Its first section classifies the game and food fishes and prohibits fishing for game fish in any manner except by rod, hook and line, or with hand lines; or for food fish, with any other device than as specifically permitted by the act.

Carp, catfish, eels and suckers, are not in either class of game or food fish, and these may be taken in eel pots, dip, fyke or seine nets, and by lay-outlines, at special seasons, as described in sections 6, 7, 8, 9 and 11 of the act; and by section 31 they may be taken at any time of the year with rod, hook and line, or with hand line not having more than three hooks. By section 37 of the Act of 1901 possession or operation of such a device or appliance prohibited or not permitted by the law, is made prima facie evidence of the violation of the act. There is no statute which authorizes the maintenance or use of a fish basket or device as charged in the information, except as provided by the permissive Act of April 27, 1903, P. L. 319, and by its provisions it is declared that the penalty for using such a basket at any other time or in any other manner, and for catching and taking any other fish than eels shall remain as heretofore. The section prescribes the manner in which such an eel basket may be licensed so as to be an authorized construction.

No penalty is fixed for the violation of the provisions of this Act of 1903, but none is necessary, inasmuch as the whole appliance or device would be an unlawful construction and punishable under the Act of 1901 unless the terms of the Act of 1903 were observed. Eels may be caught in a basket only when the prescribed license is procured. The repeal of the ninth section of the Act of 1901 by the Act of March 20, 1903, P. L. 44, refers to the use of seine nets only and no other part of the act is affected.

This record shows that the defendant is being prosecuted for a matter which is embraced in the statute which prohibits its commission, and one over which the alderman did have jurisdiction. (Commonwealth vs. Ketner, 92 Pa., 372.) In a habeas corpus case, as stated by Judge Smith, in Commonwealth vs. Gibbons, 9 Pa. Superior Court, 535: "We are to ascertain whether the court below had jurisdiction in the premises, and exercised it according to law; whether the offence of which the relators stand convicted was one which the court had power to punish summarily and whether the sentence was lawfully imposed." See also Commonwealth vs. Nuber, 6 Pa., Superior Court, 420; Ex parte Longe, 18 Wallace, 163.

The power to discharge from custody by writ of habeas corpus is one that should be exercised with extreme caution and only in a clear case. It must also be exercised in aid of the administration of justice, not to defeat or needlessly embarrass it; Quay's petition, 189 Pa., 517. After a legal trial in a court of competent jurisdiction and in which a proper judgment has been entered against him, and which

we deem sufficiently regular to sustain the commitment, the defendant has his right of appeal under the Act of April 17, 1876, P. L. 29, or by certiorari. He resorted to each of these remedies in turn and failed in his contention. He now seeks to have the Court of Common Pleas to set aside the judgment of another court of co-ordinate jurisdiction, which cannot be done. *Doyle vs. Commonwealth*, 107 Pa., 20. A writ of habeas corpus cannot be made a substitute for a writ of error and where a party is in custody by virtue of a final decree of judgment, or process thereon, of a court of competent jurisdiction, no inquiry into the process which lead to the decree is to be had, and no relief administered on habeas corpus. *Commonwealth vs. Keeper of the Jail*, 26 Pa., 279; *McCabe vs. Commonwealth*, 22 Pa., 450.

In *Commonwealth vs. Nuber*, 6 Pa., Superior Court, 420, this court allowed a writ of habeas corpus and released from custody one who had been sentenced upon a valid judgment, for the reason that the power of the court below had been exhausted in imposing the original sentence which could not be subsequently amended, hence the court was without jurisdiction to make the order under which the defendant was then held, after the term at which trial, conviction and partial sentence occurred, to alter and reform it.

The record of the alderman is free from error as to jurisdiction, procedure or sentence. The judgment of the Court of Common Pleas in discharging the defendant in this proceeding is reversed, and the record is committed to the court below, that the judgment entered by the alderman may be carried into effect.

CONSTABLE'S FEE OF TEN DOLLARS.

Under the Act of March 22, 1899, the various constables of the Commonwealth were made ex-officio fire, game and fish wardens. Under the provisions of that Act, all constables are entitled in addition to fees already authorized by law to the sum of ten dollars to be paid by the county commissioners who afterward draw one-half the amount from the State Treasury.

In Wayne county, the Commissioners objected to the payment of this reward to a constable and by mutual agreement the issue was tried upon case stated. Judge Purdy decided that the constables are entitled to the ten dollars provided in the Act, and filed the following opinion:

A. C. Lee, constable of Clinton township vs. County of Wayne.	} No. 5 May Term, 1904.
--	-------------------------

Opinion upon Case Stated.

The claim of the plaintiff is based upon the Act of the 22d of March, 1899, P. L. 1899, page 17, the title of which is as follows:

"An act making constables of townships and boroughs ex-officio fire, game and fish wardens, prescribing their power and duties, fixing their fees as wardens and prescribing their punishment for failure to perform their duties."

The fourth section of the act provides:

"Any constable or warden, upon the arrest and prosecution of any offenders to conviction under the provisions of this act, shall, in addition to the fees to which he may be entitled under existing laws, be paid for his services the sum of ten dollars, on a warrant drawn by the County Commissioners on the County Treasurer, one-half of which shall be paid out of the treasury of the respective county, and the remaining half of the said reward shall be paid by the State Treasurer into the treasury of the said county, out of moneys not otherwise appropriated, upon warrant from the Auditor General, but no such warrant shall be drawn until the respective county commissioners shall have first furnished, under oath, to the Auditor General, a written itemized statement of such expense, and until the same is approved by the Auditor General: Provided, That no county shall be liable to pay for this purpose in any one year an amount exceeding five hundred dollars."

Under the provisions of this act the plaintiff, in December last, arrested, and prosecuted to conviction, Jack Waltz, James Arthur and Wesley Peck for illegal fishing, and Philip Freeze for illegal hunting; and he claimed from the defendant forty dollars, ten dollars in each case. The defendant alleges non-liability by reason of constitutional defect in the title of the act, with respect to notice of the provision contained in the body of the act for these payments.

Does the title of this act clearly express the subject to which it is to apply? "If the title fairly gives notice of the subject, so as reasonably to lead to an inquiry into the body of the bill, it is all that is necessary." *Commonwealth vs. Mintz*, 19 Pa., Superior Court, 283. The title to the act in question gives specific notice that by its provision constables are constituted fire, game and fish wardens, their powers and duties as such wardens are prescribed and their fees fixed. Previous to this act the fees of constables for various services were a county charge; among which we may mention, costs in felony and misdemeanor cases; in arrests for vagrancy; making returns to court, etc. And, under the Act of the 30th of March, 1897, constables were constituted fire wardens and their compensation as such was made a county charge. And it may be noted in passing that the title of this latter act is also silent as to the source from which the officer is to receive compensation and the constitutionality of this act has never been questioned so far as we have any knowledge.

The title to an act need not be a complete index to its contents. Thus the act of the 8th of May, 1876, (P. L. 1876, P. 154) entitled "An Act to define and suppress vagrancy"—which, inter alia, imposes upon the county payments of the fees of the officers in proceeding under it—is held in *Hays vs. Cumberland*, 5 S. C. 159 (affirmed in 186 Pa., 109) to be good in its title.

In *Reed vs. Clearfield county*, 12 S. C. 419, it is said: "It (the county) is charged with notice because the title indicates an intent to legislate for the purpose of accomplishing that which may be reasonably expected to cause expense. This is enough; the person or

body who is to bear the expense need not necessarily be mentioned in the title." And see *Baker vs. County of Warren*, 11 S. C. 170.

The question in issue before us has been considered by Common Pleas Judges in two cases: Judge Niles, in *Hart vs. Tioga County*, Co. C. Rep. 273, holding the act unconstitutional, and Judge Dunham, in *Gunder vs. County of Wyoming*, 26 Co. C. Rep. 598, reaching the opposite conclusion. And our views accord with those expressed in this latter decision.

The presumption is in favor of the constitutionality of the Act and doubts must be resolved in favor of its validity. In *Baker vs. County of Warren*, supra, President Rice says, "Nothing but a clear usurpation of the power prohibited will justify in pronouncing an act of the Legislature unconstitutional." The increased compensation provided for in the act under discussion is offered the constable as an incentive to watchfulness and diligence on their part to detect and punish violators of the game and fish laws, and for the preservation of our little remnants of forest, which are rapidly being destroyed by annual fires kindled either by recklessness or wilful criminality.

We consider this provision for compensation to the officer beyond the usual meagre fees allowed, wise and wholesome, and its effect upon the would be violators of the law in these respects will be salutary.

Now, May 2d, 1904, judgment is entered in favor of the plaintiff against the defendant upon the case stated for the sum of forty dollars with costs.

By the Court,
GEORGE S. PURDY, P. J.

SUNDAY FISHING ILLEGAL.

In August, 1903, three men, Robert Harvey, C. T. Lippincott and W. H. Rothermel were arrested at Towanda on a complaint of a citizen who charged that the men in question had been fishing on Sunday. The defendants plead guilty and tendered the Justice four dollars and costs, being the amount of the fine under the Sunday Act of 1792.

The magistrate fined the men twenty-five dollars each under Section 17, of the Act of June 3, 1878, which says, "There shall be no fishing on Sunday." From the decision of the magistrate, the defendants appealed to the Court of Quarter Sessions, claiming that the Act of May 29, 1901, repealed those parts of the Act of 1878 in so far as they related to fishing. They also claimed that the Act of 1878 was unconstitutional. They were convicted by the Wyoming County Court and on a motion in arrest of judgment, the Wyoming County Court overruled a motion and declared Section 17 of the Act of June 3, 1878, to be in force and also constitutional. From this decision the defendants appealed to the Superior Court where the case was argued and in January term, 1905, Justice Smith handed down an opinion sustaining the conviction of the defendants. In the mean-

time one of the defendants had died. The following are the opinions of the Wyoming County Court and the Superior Court:

Commonwealth	} In the Court of Quarter Sessions of Wyoming County.
vs.	
Robert R. Harvey	
	No. 13, October Session, 1903.
	Charge Fishing on Sunday.
	Motion in arrest of Judgment.

District Attorney O. Smith Kinner for Commonwealth.
Asa S. Keeler, Esq., for Defendant.

Opinion of Hon. E. M. Dunham, President Judge for the Forty-fourth Judicial District.

The above named defendant has been convicted of "Fishing on Sunday," and the Commonwealth asks that he be sentenced under Act of June 3, 1878, Sec. 17, P. L. 160. Counsel for the defendant have filed a Motion in arrest of Judgment and have assigned several reasons in support of this motion.

First, It is contended that the Act of 1878, P. L. 160, Sec. 17, is unconstitutional, in that it offends against Rec. 3 of Art. III of the Constitution as it is claimed the title to the Act does not sufficiently set forth the contents of the act. That no notice is given that there will be any provision in the Act prohibiting fishing on Sunday.

The title of the Act is "An Act to amend and consolidate the several acts relative to game and game fish."

Now, first, is an amendment of the Acts relative to game fish, prohibits all fishing on Sunday germane to the subject of the former Acts relative to game fish? The avowed purpose of all our acts relative to game and game fish, is the protection thereof. And it would seem that an Act which prevents fishing one seventh of the time is as much germane to the subject as one that would prevent catching fish prior to a certain date, and after a certain date in each year. It has been held very often, by our courts, that all amendments to former acts, that are germane to the former acts are sufficiently expressed in the title, when it is set forth that it is an amendment to the former Act. All amendments germane to the former act may be expected and therefore the title is sufficient to cover all such amendments.

I think therefore this exception needs no further consideration, and must be overruled.

The only other exception that it seems to me needs any discussion is that the Act of May 29, 1901, P. L. 302, Sec. 48, repeals the above provision against fishing on Sunday. This exception seems to me is **a more serious one** and needs careful and serious consideration.

The Act of May 29, 1901, is intended, as a careful consideration of the title and provisions will disclose to provide full and complete provisions, as to the kinds of fish that are to be considered as game fish, and also as to what are to be considered as food fish, to regulate the time when or between what times persons may catch game and food fish. To regulate the means that may be employed to catch the same. The size of fish it is lawful to catch. And in general to supply all laws in existence as to the size of fish or manner of catching it, and to the time when the same may be caught. There is nothing in the Act of 1901, in the provisions as to catching fish, etc., that indicated any intention on the part of the legislature to go any further

than this. True the 48th Section provides as follows, "The following acts and parts of acts of Assembly are intended to be supplied by this act, and the same are hereby repealed.

1. An act to amend and consolidate the several acts relating to game and food fish, approved the third day of June, A. D. 1878; each and all the several sections in so far as they relate to fish."

Section 17 of Act of 1878 provides a penalty for hunting, shooting or fishing on Sunday. It is a matter of no consequence, whether any fish are caught or not. It is to punish the offender for the desecration of the Sabbath. There is no provision in this section that in any way relates to the kind of fish fished for, the size of fish that is caught or the means employed in fishing. It is not a provision relative to the fish, but to punish the act of fishing.

In order to give it the interpretation contended for by the defendant's counsel it is necessary to strike out a section of the Act of 1878 one word and allow the balance of the section to stand; making it unlawful to hunt or shoot on Sunday; but not to fish. I am not satisfied, that it was the intention to do so, and think that when the part relative to fish was mentioned the intention was to repeal all parts of the Act of 1878 amended or supplied by the new act and no more.

I am aware of the interpretation given this act by the Department of Fisheries, but I am not convinced that the interpretation so given is the correct one, and am compelled to overrule all exceptions.

Now, June 20, 1904, motion in arrest of judgment is overruled.

By the Court,

EDW. M. DUNHAM, P. J.

To which counsel for defendant except and at their request an exception is noted and bill sealed.

EDW. M. DUNHAM, (Seal), P. J.

Commonwealth	}	In the Superior Court of Pennsylvania
vs.		No. 40, January Term, 1905.
W. H. Rothermel		Appeal from the Court of Quarter
		Sessions of Wyoming County.

Opinion by Smith, J.

Section 17 of the Act of June 3, 1878, (P. L. 160) provides "There shall be no hunting or shooting or fishing on the first day of the week, called Sunday, and any person offending against the provisions of this section shall be liable to penalty of twenty-five dollars."

The defendant, having been convicted of fishing on Sunday contends that this act is unconstitutional, (1) in containing two subjects, game and game fish; (2) in that the subject of the 17th section is not clearly expressed in the title; and also that this section is repealed by section 48 of the Act of May 29, 1901, P. L. 302.

The title of the act of 1878 is "An act to amend and consolidate the several acts relating to game and game fish."

As to the subject of the act, there has been from the beginning, in our acts of assembly relating to hunting and fishing, such an association of bird, beasts or fish, as subjects of relation in common, with respect to time and manner of taking, and penalties for unlawful taking that they are to be regarded as forming collectively a single

subject for a statutory regulation, with the purview of the constitution; a subject embracing those creatures, *ferae naturae*, of the earth, the air and the water, which are used by men as food. While this subject includes several divisions, a statute dealing with more than one of them is not for that reason unconstitutional. Neither is it a valid objection to the Act of 1878, that the penalties which it imposes are not expressed in the title.

The subject of the act, as set forth in its title, is the amendment and consolidation of pre-existing acts relating to game and game fish. Therefore, anything germane to any of these acts, and which might properly have been embraced in any of them, under its title, may be included under the title of the amending act. The acts thus amended and consolidated aimed at regulating the taking of wild animals, birds, and fishes, by restrictions on the time and method of taking. Since regulation is made effective only through penalties, a title expressing a purpose to regulate implies such penalties: *Com. vs. Sellers*, 130 Pa., 38; *Com. vs. Silverman*, 138 Pa., 642; *Com. vs. Jones*, 4 Pa., Superior Court, 362. There is, in principle, no distinction between a prohibition of hunting or fishing on a specified day and during a specified period; and it is for the legislature to fix the times and seasons in which these acts shall be permitted or forbidden. In the case before us, section 17 is not only germane to the acts which are amended and consolidated, but is in terms a re-enactment of section 16 of the Act of May 5, 1876, which is itself an act amending and consolidating the preceding acts in relation to game and fish.

There is no substantial ground for regarding section 17 of the Act of 1878 as repealed by section 48 of the Act of 1901. The subject of the latter act, as expressed in its title, is the encouragement and regulations of the propagation of fish, by restricting methods of fishing, and establishing closed seasons for the different species. Section 48 provides that: "The following acts and parts of acts of Assembly are intended to be supplied by this act, and the same are:

1. An act to amend and consolidate the several acts relating to game and game fish, approved the 3d day of June, A. D. 1878; each and all the several sections thereof in so far as they relate to fish."

The obvious construction of this is that it repeals those sections of the Act of 1878, relating to fish only so far as they are supplied by the Act of 1901; such being declared intention of the repealing clause. The latter act supplies every provision of the former relating to the subject of the latter; that is to say, the propagation and protection of fish. But it supplies neither the prohibition or the penalty of fishing on Sunday, and there is no apparent intention in either the title or the body of the act to repeal any prohibition or penalty not therein supplied. Section 17 of the Act of 1878 apply alike to hunting, shooting and fishing. To remove the prohibition as to one by an implied repeal, while it remains as to the others, is a mutilation of its provisions for the prevention of all which cannot be regarded as within the legislative intent.

Judgment affirmed.

EXCESSIVE NUMBER OF LINES.

On October, 1904, C. C. Kutz and P. W. Lookenbill were arrested in Cumberland county for using a number of lines with two hooks on each, and having in possession a number of suckers and catfish.

They were convicted before the Justice of the Peace and fined. They appealed to the Court of Quarter Sessions where the Judgment of the Justice was reversed and set aside by Judge Sadler. This decision was not in accordance with the views of the Department; but no appeal was taken because the matter was to be taken up from another court and the Department did not wish to multiply appeals in the Superior Court.

Commonwealth	}	In the Court of Quarter Sessions of Cumberland County.
vs.		
C. C. Kutz and P. W. Lookenbill.		

Appeal from judgment of H. S. Mohler, Justice of the Peace.

Per Curiam:

In the month of October, 1904, C. C. Kutz and P. W. Lookenbill were observed by W. E. Shoemaker and J. W. Crisswell, State Fish Wardens, fishing in the Conodoguinet Creek. The said Kutz and Lookenbill were on the shore of said stream and were using a number of lines with two hooks on each, and had in their possession from twelve to fifteen "suckers and catfish." They were arrested on the 26th day of October, and an information made against them by said Crisswell before J. B. Martin, Esq., Justice of the Peace, charging them with "unlawfully fishing with an excessive number of hand-lines or set devices consisting of twenty-six or more hand lines, each hand line having two hooks or more, therefore said hand lines or device or devices are in number not permitted in an Act approved May 29, 1901, in violation of section 2 and 31 of said act." A warrant was issued by the said Justice and a hearing had on the 31st day of October following, and the case dismissed by the Justice on the 7th of November thereafter.

On the 23d day of the same month (November), another information was made against the same parties by W. E. Shoemaker charging them with "unlawfully fishing and having in possession an excessive number of hand lines in the waters of the Conodoguinet Creek, county aforesaid (Cumberland), said devices consisted of twenty-six or more lines, each having two or more hooks thereon, said hand lines or devices, in said number, are not specifically permitted in Act approved May 29, 1901, in violation of section 2 and 31 of said act."

A warrant having been issued by Justice H. S. Mohler, before whom the information was made, the defendants were again arrested and a hearing had before him, in the Borough of Mechanicsburg on the 26th day of November, 1904, and on December 2d following, he "adjudged the defendants guilty and sentenced each of them to pay

a fine of \$25.00 and one-half the costs of the suit, being the sum of \$30.45."

The first section of the Act of 29th of May, 1901, provides for what fish are specifically within the protection of the act, to wit: game fish and food fish.

Game fish, as there defined, consist of, "salmon, brook trout, and all other fish belonging to the family of salmon and trout; black bass, green or Oswego bass; crappie, grass or strawberry bass, white bass, rock bass, blue pike, pike perch, Susquehanna salmon, or wall-eyed pike, pickerel, sunfish and muscalonge. And food fish are designated to consist of shad, white fish, herring, lake herring, Cisco herring, alewife, sturgeon, striped bass or rock fish.

That the Legislature had the undoubted right to make such definition in limitation of the common meaning of the words is settled in *Commonwealth vs. Conry*, 4 Superior Court, 356.

The information made against the defendants in the present case, charged violations of the 2d and 31st sections of the aforesaid Act of 1901.

By the said section 2d it is provided: "That from and after the passage of this act, it shall be unlawful to fish for game fish, in any of the waters of the Commonwealth, in any manner except with rod, hook and line, or with hand line having not more than three hooks; or for food fish with any device not specifically permitted in this act."

And the other section is as follows: "That nothing in this act shall prohibit the taking of any fish not herein specifically designated as game or food fish, at any time of the year, with rod, hook and line, or with hand line having not more than three hooks: Provided, That nothing in this section shall be so construed as to apply to any fish, not herein specifically designated as game or food fish, which the Fish Commissioners by proclamation may hereafter declare a close season on, for propagation purposes, and then only within the waters designated by such proclamation."

In the present case the fish taken by the defendants, and found in their possession were neither what the act of Assembly denominates "game fish" or "food fish." They were "suckers" and "catfish." To take these is not made unlawful by either of the sections of the Act of 1901 for which the defendants were charged with violation.

The only inhibitions against the catching of eels, carp, catfish and suckers, are in the 7th section of the act which provides that they may not be taken "with dip-nets from streams not inhabited by trout except during the months of March, April, May, October and December," and in the 8th section, which limits the taking of the same with fyke nets, when the stream is inhabited by brook or speckled trout, to the months of March, April, May, October and December, and in waters inhabited by shad to the months of April and May. While the 9th section renders it "lawful to catch with seine nets, at any time of the year, in waters not inhabited by trout." And the 11th section, by which it is provided that "from and after the passage of the Act, it shall be lawful from sunset to sunrise only, to catch eels, carp, catfish and suckers in the waters of this Commonwealth not inhabited by brook trout, by means of what are known as lay out lines."

There was no evidence to show that the Conodoguinet creek is inhabited by trout of any description or by shad.

Not only did the defendants not take or have in their possession any game or food fish, but they did not use "lay out lines" as insisted upon at the hearing of the appeal. What is regarded in common parlance as a "lay out line" was clearly shown by the uncontradicted testimony of a number of intelligent witnesses who have had experience as fishermen, and it also appeared in the same way that what was used by the defendants was what is known as a "throw line."

The contention that these throw lines happened to be on the same side of the stream and thus connected by land, were therefore "lay out lines," could hardly have been serious, but if so it requires no discussion to demonstrate its fallacy.

It may also be observed that neither by the information made by Criswell before Martin nor that of Shoemaker before Mohler allege that the device used by the defendants was a "lay out line." The first charging that twenty-six or more "hand lines" were used by the defendants, and in the other that "said hand lines or devices in said number are not specifically permitted in Act approved May 29, 1901, in violation of sections 2 and 31."

The position on which the appeal was allowed by the court contained ample averments to justify its action, and the authorities cited on behalf of the Commonwealth need only be examined to justify this conclusion.

We decide therefore without hesitation: First, That there was no violation of the second and thirty-first sections of the Act of May 29, 1901, by the defendants.

Second. That the defendants were not charged in the information with having used "lay out lines" and did not in fact use such a device.

Third. That the appeal was properly allowed by the court.

It is, therefore, unnecessary for us to discuss or determine the question whether the action brought before Justice Martin was a bar to the second one instituted before Justice Mohler, although we incline to the opinion that this is so, as the Justice had full jurisdiction to hear the case, to pass upon the guilt or innocence of the parties accused, and if convicted, to impose by sentence the penalties prescribed for the infraction of the law.

And now 20th of February, 1905, the appeal of the defendants is sustained, and the determination and sentence of Justice Mohler is reversed and set aside at the costs of the Commonwealth.

By the Court,
W. F. SADLER, P. J.

In August, 1905, William R. Bercaw was arrested in Wyoming county for using more than one rod, hook and line or hand line, having not more than three hooks. The defendant was convicted before the Justice and fined, whereupon he took an appeal to the Court in Wyoming county which reversed the judgment of the alderman and discharged the prisoner. To this ruling the Department took exception and appealed to the Superior Court where the case was argued at the January term, 1906. The following is the opinion of Judge Terry:

Terry, P. J., October 21, 1905: That is an appeal from a summary conviction under the Act of 29th of May, 1901, P. L. 302. The defendant is charged with the violation of the provisions of the second section thereof, which reads as follows: "That from and after the passage of this act it shall be unlawful to fish for game fish, in any of the waters of this Commonwealth, in any manner except with rod, hook and line, or with hand line having not more than three hooks; or, for food fish, with any device not specifically permitted in this act. Any person violating any of the provisions of this section shall, on conviction thereof as provided in section thirty-eight of this act, be subject to a fine of twenty-five dollars."

The case came before the Court on an appeal, as stated, and was heard in accordance with the practice in cases of summary conviction, when it appeared that the defendant was arrested by a special fish warden for fishing with rod, hook and line and with hand lines in the Susquehanna river. The Justice fined the defendant twenty-five dollars. The evidence taken before the court clearly shows that he was fishing with a rod, hook and line and also with one hand line with two hooks thereon. It was claimed by the Commonwealth that he had two hand lines in use, but the weight of the evidence is against such contention. Therefore we find as a fact that he was fishing with but one hand line. The only question before us is this: Is it lawful for a person to fish with rod, hook and line and a hand line having not more than three hooks, at the same time? The section referred to makes all manner of fishing for game unlawful except two specified modes. Those two methods are legalized. The Legislature has said to the individual: you may fish for game fish in two ways, first, with rod, hook and line; second, with hand line having not more than three hooks, all other modes are prohibited. This, in our opinion, does not mean to confine the person to one or other of these methods. If the words "and" had been substituted for "or" it could have been contended with equal plausibility that both modes were meant to be employed at the same time. To escape this construction the word "or" may have been used. However this may be, we think the section under consideration simply distinguishes the unlawful from the lawful modes of fishing, and that if a person avoids the former he is not required to make choice of the latter. If the meaning of this provision of the law is not clear we must apply the rule of interpretation governing in such cases. Penal statutes must be construed, in cases of doubtful meaning in favor of the accused, and it is a reasonable expectation that when the Legislature "intends the infliction of suffering or an encroachment upon natural liberty or rights, or the grant of exceptional exemptions, powers and privileges, it will not leave its intention to be gathered by mere doubtful inference, or convey it in cloudy and dark words only—for an offense cannot be created or inferred by vague implications—but will manifest it with reasonable clearness." Endlich on the Interpretation of Statutes p. 452.

If the legislative intent had been to prohibit fishing with a rod, hook and line and a hand line at the same time, we think it would have been definitely expressed. In the absence of such expression we think it was not intended. Therefore the defendant has not been guilty of a violation of the act under which he was arrested and accordingly he is now discharged. The county is directed to pay the

costs of prosecution. By the Court. To which the Commonwealth excepts, and at its request a bill is sealed.

(Seal)

CHARLES E. TERRY, P. J.

UNCONSTITUTIONALITY OF THE ACT OF APRIL 22, 1905.

In August, 1905, Samuel E. Light and Grant Hess were arrested for emptying poisonous substance in the Swatara creek, in Lebanon county, at various times and caused the killing of many fish. They were convicted before the Justice of the Peace and sentenced to pay a fine of \$100. Counsel for the defendant appealed to the Lebanon County Court under the Act of April 22, 1905. The counsel for the Department moved to strike off the appeal on the ground that the act was unconstitutional. The court granted the motion to strike off the appeals and ordered the appeals quashed on the ground of the unconstitutionality of the Act of April 22, 1905. Following is the opinion of the court:

Commonwealth	} In the Court of Quarter Sessions of Lebanon County, of September Sessions, 1905, No 68. Motion to strike off appeal, etc.
vs.	
Samuel E. Light and Grant Hess.	

By the Court:

The defendants were convicted and sentenced before a Justice of the Peace for a violation of Section 26 of the Act of the Assembly, approved May 29, 1901, P. L. 311. The defendants both appealed under the provisions of the Act of April 22, 1905, P. L. 284, and the Commonwealth now moves the court to strike off and quash said appeal on the ground that the said act is unconstitutional.

The proceeding before the Justice was summary and under the provisions of the Act of April 17, 1876, relating to appeals in cases of summary conviction an appeal could only be had to the Court of Quarter Sessions upon allowance of the said Court or any Judge thereof on cause shown.

The Act of April 22, 1905, is an amendment to the Act of April 17, 1876, and provides, in part, as follows: "That in all cases of summary conviction in this Commonwealth before a magistrate or court not of record, this defendant may, within five days after such conviction appeal to the Court of Quarter Sessions of the county in which such magistrate shall reside or court not of record shall be held, upon entering into good and sufficient recognizance with one or more sureties, to answer said complaint, on a charge of misdemeanor, before said court." This portion of the Act of 1905, is in conflict with section 14 of Art. 5 of the Constitution of 1874, and is a clear violation of its provisions; which is as follows: "In all cases of summary conviction in this Commonwealth, or of judgment in suit for a penalty, before a magistrate, or court not of record, either party may appeal to such court of record as may be prescribed by law, upon

allowance by the Appellate Court, or judge thereof, on cause shown." While it is undoubtedly true that this section of the Constitution is not self-enacting, yet all that is required of the legislature to make it operative is to prescribe the court to which an appeal may be taken in summary convictions and judgment in suits for penalties, but only in the manner provided by the Constitutional provision, that is, upon allowance of such prescribed court on cause shown. The legislature, in addition to designating the court to which an appeal may be taken, can prescribe the time in which the appeal must be taken, and the method of procedure in the appellate court, because such provisions are not in contravention but in furtherance of the Constitutional provision.

The evil that the Constitutional provision was intended to remedy by the right of appeal, was fully discussed by the framers of the Constitution, as appears in Vol. VII, page 515, etc., Debates Const. Convention. When the limitation to the right of an appeal was under consideration, Mr. McVeagh asked the question "Why cannot the remedy for the evil as it exists be safely left to the Legislature?" To which Mr. Armstrong gave the reason why the convention should adopt, and afterwards did adopt the section of the Constitution as above quoted in the following words: "I was quite of opinion that it could be left safely to the Legislature, when this section was under consideration; and yet I did not think, as it touched the liberty of the citizen, that it was of sufficient unimportance to refer it exclusively to the legislature, and I was quite willing it should become a Constitutional provision; but I trust the gentleman from Allegheny will withdraw his objection to this amendment which seems to be a reasonable precaution and limitation against the abuse of a rule which is intended to correct abuses; and do not let us run the risk of making the remedy (the right of appeal in all cases of summary proceedings without limitation) worse than the disease" (the right of appeal in none).

In the Act of April 22, 1905, the legislature attempts to give an appeal to the defendant in a summary conviction without the limitation prescribed by the Constitution. The act is therefore unconstitutional.

And now, November 14, 1905, the motion to strike off the appeals is granted and the appeals of both defendants are stricken off and quashed.

Signed,

A. W. EHRCOOD, P. J.

DEFECTS IN MAGISTRATES' RECORDS.

One of the troubles the Department has had to meet has been due to the carelessness or ignorance of magistrates in the lower courts. Instead of following the plain directions of the law and decisions of the court, they in many instances will not make up their records correctly even when they are shown or told how. The result has been

that on writs of Certiorari where the records have come up for review, the appellate court has been compelled to reverse the decision of the magistrate. As an example of this we give the following record of a case tried in Franklin county:

Commonwealth	}	In the Court of Quarter Sessions of the Peace of Franklin county, Pa.
vs.		
Joseph Snively and George Needy.		No. 12 of December Sessions, 1905.

Summary conviction of violation of fish laws.

Appeal of the defendants from the judgment of D. S. Martin, Esq., justice of the peace.

Specifications of Error.

The conviction of the defendants by the magistrate was erroneous and invalid for the following reasons, to wit:

First. The evidence taken before the magistrate and sent up with the record fails to show that the defendants violated any law of the Commonwealth.

Second. The said evidence fails to show that the defendants or either of them at any time fished within the limits of the county of Franklin.

Third. The said evidence fails to show at what time the alleged fishing therein mentioned was done by the defendants; whether within the statutory period of limitation or not.

Fourth. The gravamen of the offence charged in the information is that the defendants "did unlawfully fish and take in and from the waters of Red Run, a stream inhabited by trout," and the evidence taken in the case and sent up with the record fails to show that said stream, Red Run, was or is inhabited by trout, and it further fails to show that said stream is within the limits of the county of Franklin.

Fifth. The magistrate fails to find any specific act done by the defendants, by which the court may determine whether such act was illegal or not, or whether the fine imposed by the magistrate is in accordance with law.

(Signed)

BOWERS & BOWERS,
Attorneys for Appellants.

Commonwealth	}	No. 12 of December Term, 1905.
vs.		
Joseph Snively and George Needy.		Appeal from summary conviction.

Per curiam:

Admittedly the proceedings cannot be sustained.

The first, third, fourth and fifth assignments of error are all well taken and any one of these would suffice to reverse.

Now, December 26, 1905, proceedings reversed and the conviction and sentence set aside.

A. WATSON ROWE,
President Judge.

Warrant issued September the 1st, 1905, to Samuel Rock, constable on oath of J. W. Criswell, fish warden of the Commonwealth of Pennsylvania, who being sworn according to law, says that on the information received from others, that on or about the 30th day of May, 1905, at Washington township, Franklin county, Pennsylvania, the defendants, Joseph Snively and George Needy did unlawfully fish and take fish in and from the waters of Red Run, a stream inhabited by trout, and other waters of aforesaid county and State with an illegal device, namely, a stir net, not specifically permitted, and being contrary to existing laws relative to fish and fishing in streams of this Commonwealth, and a violation of section two and other section and acts now in force in the Commonwealth relative to fish laws.

Now, September 1, 1905, defendants arrested and held on their own recognizance until to-morrow, Saturday the 2d of September, 1905, at 1 o'clock P. M. Now September the 2d, 1905, 1 o'clock P. M. parties appear—J. W. Criswell, warden Fish Commission of Pennsylvania, and Charles Walter, Esq., for defendants.

J. W. Criswell, warden, being sworn, says that all he knows about the case is from information received from others. Martin Gift having been sworn, says that he knows one of the defendants, Joseph Snively, that he saw the said Joseph Snively sitting on the fence with net along side of road, that he came down the stream with net, that he could not tell what kind of a net it was, did not see any fish, saw both defendants at the spring, did not know which one of the defendants had the net at that time.

Archy Harbaugh being sworn, says that he was out at the railroad where trestle crosses the Red Run, with a stir net, that the said George Needy held a net, and that the said Joseph Snively had a pole endeavoring to scare the fish into the net, that he saw both defendants in the water and saw fish in the net.

Defendants don't testify. After hearing the testimony of the witnesses, the defendants, namely, Joseph Snively and George Needy are adjudged guilty as charged, and each sentenced according to the Act of Assembly to pay \$25 fine and costs of suit.

I certify that the above is a correct transcript of the proceedings had before me in above suit, and of record on my docket.

Com. of Pa.
vs.
Joseph Snively
and
George Needy.

Inf.,	\$0 50
Docket,	25
2 warrants,	1 00
2 Recog.,	1 00
2 Sups.,	85
Hearg.,	50
3 oaths,	50

Trans.,	\$3 90
	50

Trans.,	\$0 50
Pd. by dfts.,	

Court.	
Service,	\$2 00
Milg.,	24
2 Sups.,	65
	\$2 89

Witnesses.	
Mart Gift,	50
A. Harbaugh, ..	50

Witness my hand and official seal this 4th day of September, 1905, at Waynesboro, Pa.

[Seal.] D. B. MARTIN, J. P.
Justice of the Peace.

My commission expires May 8, 1908.

Com. of Pa.
vs.
Joseph Snively
and
George Needy.

Recog. \$0 50
Trans., 50
\$1 00

Now September 7, 1905, defendants appealed to the court of quarter sessions of the peace of Franklin county, Pa., appeal having been allowed by Hon. D. Watson Rowe, President Judge.

Defendants with Samuel Needy and William H. Johnson as bail held in the sum of \$100 each, condition that they appear at the next court of quarter sessions of the peace to be held in Chambersburg, in aforesaid county, and to abide the judgment of the court in that behalf.

I hereby certify that the above is a correct transcript of the proceedings had before me in above case and of record on my docket.

Witness my hand and official seal this 7th day of September, 1905.

(seal) D. P. MARTIN, J. P.

Justice of the Peace.

My commission expires May 8, 1908.

Commonwealth

vs.

Joseph Snively and George Needy.

To the Honorable D. Watson Rowe, President Judge of the court of quarter sessions of the peace of Franklin county, Pennsylvania.

The petition of Joseph Snively and George Needy, the defendants in the above entitled case, respectfully sheweth as follows:

That at a hearing before D. B. Martin, Esq., a justice of the peace and for the borough of Waynesboro, Pa., held on Saturday, September 2, 1905, upon information made against them, the said defendants, by J. W. Criswell, fish warden of the Commonwealth of Pennsylvania, charging them with having, on or about the 30th day of May, 1905, at Washington township, Franklin county Pa., "unlawfully fished and taken fish in and from the waters of Red Run, a stream inhabited by trout, and other waters of aforesaid county and State, with an illegal device, namely, a stir net, not specifically permitted," etc., they the said defendants were adjudged guilty, and were each sentenced to pay a fine of \$25 and the costs of prosecution.

That the evidence offered at the said hearing, and contained in the transcript of the proceedings before the justice of the peace was utterly insufficient to warrant the conviction of the defendants or the imposition of a fine and costs as aforesaid, upon said defendants.

Your petitioners therefore respectfully pray the court for the special allowance for an appeal from said judgment, to the court of quarter sessions of the peace of Franklin county, Pa., to the said justice of the peace, in order that the judgment herein complained

of may be reviewed in quarter sessions court in such manner as may to law and justice appertain.

And they will ever pray, etc.

JOSEPH SNIVELY,
GEORGE NEEDY.

APPEALS IN SUMMARY CONVICTIONS TRIED DE NOVO.

On May 13, 1904, E. J. Ehrgood was arrested by Warden C. S. Lowery while in the act of fishing with a bag that he used as a net in his mill race in the village of Moscow, Lackawanna county. When arrested, Ehrgood showed fight, but was quieted down and taken before a justice of the peace who fined him \$25 for using an illegal device and an additional hundred dollars for resisting the officer.

Two men who were with him were also fined \$25 a piece which they paid. Ehrgood refused to pay and was sent to jail. His attorney took out an appeal and the case was heard before Judge John P. Kelley. The plaintiff's lawyer, among other contentions, claimed that the magistrate's docket did not show that the witnesses were sworn and therefore the verdict of the magistrate should be set aside.

They also claimed that the man was fishing on his own land in a stream he had constructed himself and he was therefore not amenable to the fish laws of the Commonwealth. All these contentions were overruled, the court deciding that in case of an appeal of this character the magistrate's docket was not in evidence as the court heard the case de novo. He also ruled that the police powers of the Commonwealth extended over private waters else the laws could be made a farce. The following is the opinion of the judge:

Commonwealth	}	In the Court of Quarter Sessions of Lackawanna county.
vs.		
E. J. Ehrgood.		

No. 347 June Sessions, 1904.

APPEAL FROM SUMMARY CONVICTION.

Opinion of Court.

On the 13th day of May, 1904, the defendant, in company with two others, was caught fishing for trout with a net in his mill race in the village of Moscow. The race is fed by the waters of Roaring Brook, a trout stream. He was arrested by one of the fish wardens of the Commonwealth and taken before a justice of the peace, and an information was then made by the fish warden charging him with

fishing with a net for trout in the waters of Roaring Brook, and with having resisted arrest, and forthwith a hearing was had and the defendant was fined \$125 and costs, and in default of payment he was committed to the county jail for 130 days. An appeal was allowed upon defendant entering bail in the sum of \$300, conditioned to abide the event of the suit, etc.

At the hearing had before us the evidence conclusively showed that the defendant was guilty of both charges, so unless there is some technical defense we must find him guilty. We are not required to examine into the regularity of his conviction before the justice as we would upon certiorari. The general rule is that in an appeal a case comes up de novo upon its merits. But the defendant questions the jurisdiction upon the ground that no warrant of arrest was ever issued. Even if he has the right to raise that question after entering bail to appear, which we doubt, there is no merit in it, because the thirty-third section of the act (Act 29th May, 1901, P. L. 302) provides that a fish warden, and certain other officers, are authorized and commanded to apprehend and arrest without warrant any person violating any provision of the act, and immediately take him before a magistrate, and thereupon make charge of such violation of the law, and that the magistrate shall forthwith hear and determine the charge. That is just what was done in this case.

The claim that because the fishing was done in the tail race of the mill upon the lands of the defendant cannot avail him as a defense. It was in the waters of the Roaring Brook, which he had diverted to operate his mill. If one could evade the law by digging an artificial channel and diverting the waters of a trout stream into it, and taking the fish from it in that way, the act would have but little efficacy. We, therefore, under the law and the evidence, are required to convict the defendant, and we do now adjudge him guilty of a violation of the second section of the Act of May, 1901, P. L. 302, in that on the 13th of May, 1904, he fished for game fish in the waters of this Commonwealth in a manner forbidden, viz: with a net; and we do further adjudge him guilty of a violation of the thirty-fifth section of the act, in that on the same day he resisted arrest.

By the Court.
JOHN P. KELLY, A. L. J.

August 7, 1905.

From the Record.

Now, December 11, 1905, on motion of district attorney, a capias is issued for E. J. Ehrgood, the above named defendant, for sentence.

By the court. Same day capias issued.

Now, December 15, 1905. Sheriff returned capias C. C. et. C.

Charge. Resisting arrest. Now, December 16, 1905, the sentence of the court (by Hon. J. P. Kelly, A. L. J.), is that you, E. J. Ehrgood, pay a fine of \$25 to the Commonwealth of Pennsylvania, pay the costs of prosecution, and stand committed until this sentence be complied with. Exit Cert.

Charge. Illegal fishing. Now, December 16, 1905, sentence suspended upon payment of costs.

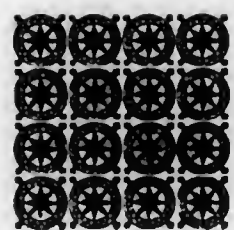
HON. JOHN P. KELLY, A. L. J.

INDEX.

	Page.
Carp Industry in Pennsylvania for 1904,	162
Commissioner of Fisheries, Report of,	15
Atlantic Salmon,	55
Bass Season,	19
Black Bass Culture,	54
Blue Pike and Wall-Eyed Pike Industry,	36
Brook Trout Industry,	37
California Trout,	60
Carp Industry,	30
Cause for Depleting Waters of Fish,	79
Commercial Brook Trout Industry,	26
Commercial Fishes,	26
Concurrent Legislation for the Delaware River,	99
Eel Industry,	32
Fish and Eggs from the United States,	67
Fish Car,	76
Fish Cultural Work,	24
Fish Culturists Scarce,	71
Fisheries of Lake Erie,	33
Fish Protective Association,	75
Fishways Erected,	77
Freezing Trout,	71
Frog Culture,	51
Further Experiments in Work Recently Begun,	50
Gathering Eggs at Lake Erie,	69
Gathering Wild Trout Eggs,	68
Goldfish for Public Schools,	62
Herring Industry,	30
Interest Exhibited by Railroads,	74
International Fishing Troubles on Lake Erie,	97
Lake Erie Carp,	36
Lake Herring,	35
Locating New Hatcheries,	73
Muscallonge Culture,	65
New Hatching Jar,	70
New Work Undertaken,	57
Office Work,	108
Other Fishes,	24
Other Work in Fish Culture,	63
Philadelphia and Pittsburg as Aids to the Department,	78
Philadelphia Carp Industry,	26
Pickrel Fishing in the Lakes,	23
Pollution of Streams,	91
Propagation of Pickrel,	57

Commissioner of Fisheries, Report of—Continued.	Page.
Proposed Dam on the Susquehanna River,	106
Proposed Tri-State Hatchery,	74
Recommendations of the American Fisheries Society,	104
Removal of Carp,	77
Salmon for the Delaware,	67
Shad Industry,	26, 23
Shad Work for 1906,	65
Smelt Work,	66
State Fisheries Association,	76
Sturgeon Culture,	64
Susquehanna Eels,	26,
Trout Eggs from Private Hatcheries,	68
Uniform Laws for the Great Lakes,	102
Wall-Eyed Pike or Susquehanna Salmon Season,	23
Work of Hatcheries,	39
Corry Hatchery, No. 1,	39
Erie Hatchery, No. 2,	42
Bellefonte Hatchery, No. 3,	43
Wayne Hatchery, No. 4,	45
Torresdale Hatchery, No. 5,	47
Union City Auxiliary, No. 6,	49
Yellow Perch,	36
Department of Fisheries of the State of Pennsylvania,	1
Financial Statement,	110
Fishery Commission, Report of,	7
Letter of Transmittal,	3
Meeting of State Fisheries Association of Pennsylvania,	189
Notes on Carp Industry in Philadelphia for 1905,	169
Notes on German Carp,	166
Opinions of the Attorney General,	180
Closed Season in Boundary Lakes,	187
Fishways,	181
Gigging or Speaking not Legal,	180
Nets, Unlawful in the Ohio River and Tributaries,	184
Only One Tip-up Legal,	180
Opinions of the Various Courts,	209
Act of April 22, 1905, Unconstitutional,	219
Act of April 25, 1905, Unconstitutional,	222
Appeal from Summary Conviction,	241
Appeals in Summary Convictions Tried De Novo,	241
Are Suckers Under Law,	217
Constables' Fees of Ten Dollars,	226
Defects in Magistrate's Records,	237
Dynamite Case,	215
Excessive Number of Lines,	232
Fishing in Private Waters,	220
Fyke Nets to Wing Walls Unlawful,	214
Illegal Eel Baskets,	223
Selling Game Fish from Lake Erie Out of Season,	209
Sunday Fishing Illegal,	228
Unconstitutionality of the Act of April 22, 1905,	236
Preliminary Report on the Investigation of Certain Waters of Pennsylvania,	172
Report of Fishery Commission,	7
Report of the Commissioner of Fisheries,	15
Reports of Superintendents of Hatcheries,	111
Corry Hatchery, Station No. 1,	111
Erie Hatchery, Station No. 2,	119
Bellefonte Hatchery, Station No. 3,	127

Reports of Superintendents of Hatcheries—Continued.	Page.
Wayne County Hatchery, Station No. 4,	137
Torresdale Hatchery, Station No. 5,	153
Union City Auxiliary Hatchery, Station No. 6,	159
Shad Industry of the Delaware River for 1905,	171
Superintendents of Hatcheries,	1
Superintendents of Hatcheries, Report of,	111



END OF YEAR